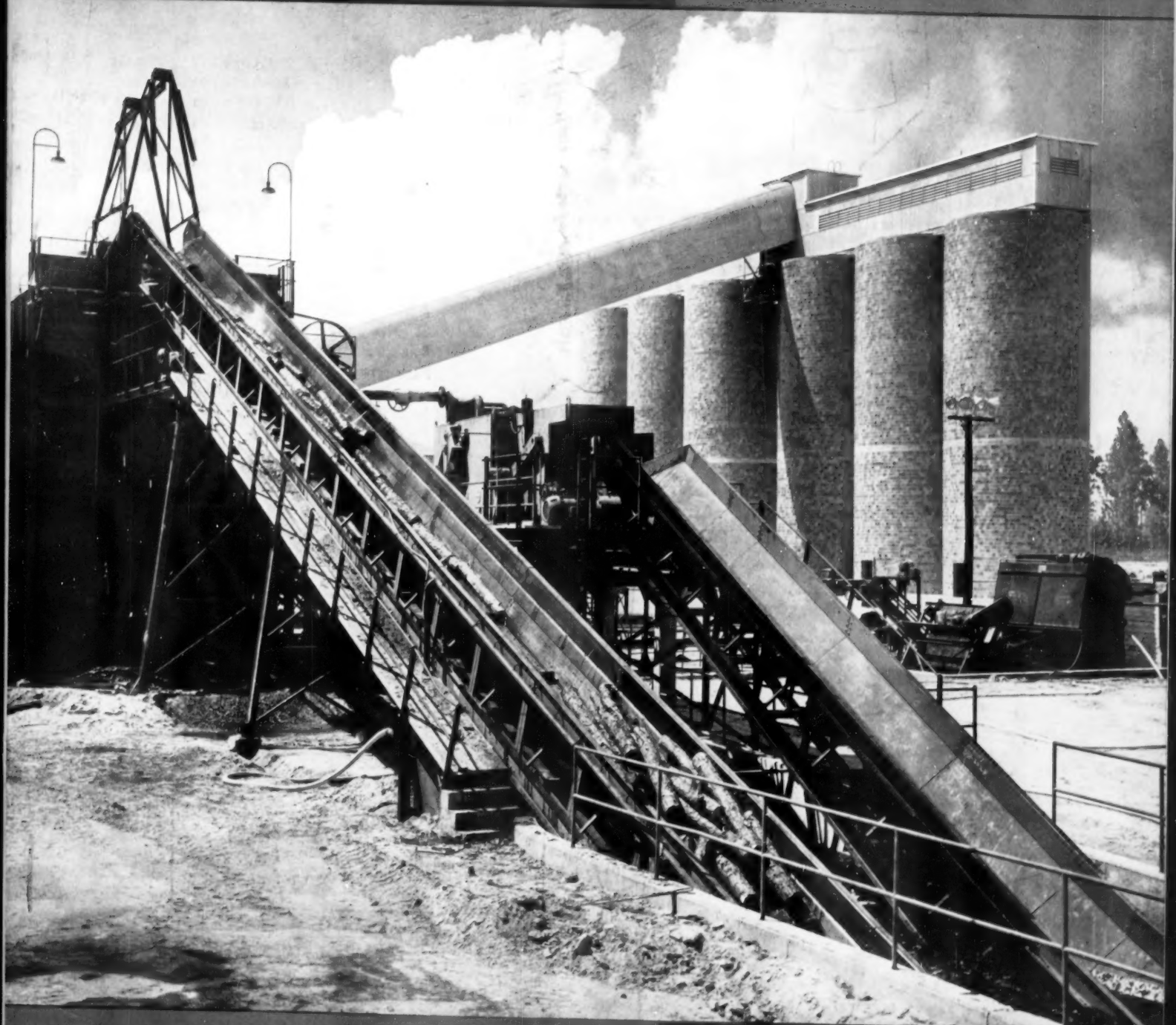
PULP & PAPER

Highlights of Discussions and Papers from . . .

Symposium at Appleton
see page 60

Birmingham Pulping Meet
see page 56

Maine Woods Tour Reveals Innovations at Great Northern
see page 70



90 FT. CHIP BINS at Rayonier's new Jesup, Ga., mill—tile lined, 30 ft. in diameter—utilize industrial TV cameras that tell operator at ground level what's happening at top
see page 72

NOVEMBER 1954

an Important Difference...to fit any sizing need...your choice of 25

ALWAX* and WAXINE® Sizes

Choose the sizing properties you want in your papers... then let your Cyanamid representative help you achieve them with one or more of the *twenty-five* grades of ALWAX or WAXINE Sizes. Rigidly quality-controlled, these sizes have been tested and studied under countless mill conditions, so that their performance and results are precisely determinable in most cases—no guesswork and no variation from batch to batch!

You'll find this tremendous selection of acid stable, alkali stable, and acid-alkali stable wax emulsions a valuable asset in improving the sizing results of your papers.

Recent Mill Developments With Cyanamid Paper Chemicals...

Laundry Tags That Withstand Perchloroethylene in dry-cleaning processes are now being made of papers treated with PAREZ® Resin 607, the MELOSTRENGTH® Resin for dependable wet strength. It is believed that this is the only resin capable of imparting such resistance to laundry tag paper.

* * *

Better Printing With Aniline Ink on milk bottle cap laminated to aluminum foil is credited to Sodium Phospho Aluminate. ½% of Sodium Phospho Aluminate added to the tray water to pH 6.0 is the procedure at a Midwest mill. The mill reports that previous printing difficulties due to acidity of the paper have been practically eliminated.

* * *

A Rise In Butyl Carbitol Test from 35" with water to 60" with CYRON® Synthetic Size was achieved at an Eastern mill. The size was dissolved according to instructions, neutralized to pH of 7.0 with caustic. A defoamer was added and the CYRON applied at a 1% concentration to the surface of a white patent coated sheet from one water box on the calender stack, giving the significant improvement in test results.

* * *

More Uniform Machine Coating with AZITE® 900 Liquefier is reported by one Southern mill, using 10% AZITE based on casein adhesive.

*Trade-mark

THE LARGEST VARIETY OF PAPER CHEMICALS, *to serve every industry need, is offered by Cyanamid, and is backed by the services of technical experts with years of practical mill experience.*

AMERICAN *Cyanamid* COMPANY
PAPER CHEMICALS DEPARTMENT
30 Rockefeller Plaza, New York 20, N. Y.

Sales Offices: Boston • Charlotte • Chicago • Cleveland • Kalamazoo • Los Angeles • Mobile • New York • Philadelphia • Seattle
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A New Concept in Roll Wrapping!

SPIROLWRAP*

Rice Barton gives you, in one package, all the advantages of spiral wrapping, plus a faster, more economical roll-wrapping and crimping operation.

* REG. U. S. PAT. OFF.

RICE BARTON

RICE BARTON CORPORATION

Worcester, Massachusetts

Paper Machine Builders Since 1837

West Coast Distributor: Ray Smythe . . 501 Park Building • Portland, Oregon

RB11-54

PROGRESS — at 180 MILES PER HOUR!

● **THE TIME: 8:00 A.M. . . . THE PLACE: BUFFALO AIRPORT**
DESTINATION: WOODLAND, MAINE

A Lockport Felt Company Technical Service Representative, Richard S. Buckley takes off (left), with Company Pilot Don Goodridge for Woodland, Maine, location of the St. Croix Paper Company. Trips like this are routine for Lockport executives, production heads, sales and service representatives. Lockport's experience with company-owned planes for special service and deliveries began in 1931 . . . another Lockport Felt "First."

● **5 HOURS LATER . . .**
ST. CROIX PAPER MILL,
WOODLAND, MAINE

Dick Buckley checks a TENAX FELT on a St. Croix Machine, with Mill Superintendent F. L. Coons.

No matter where, or when, or how quickly any paper mill needs technical assistance in any phase of felt operation . . . a Lockport Representative can be on hand . . . in hours if necessary. The Lockport Felt Company's twin-engine Beechcraft is based at Buffalo Airport . . . just 24 miles from the Newfane Plant. This Technical Service is available to any paper mill, without obligation.

● **9:00 A.M. NEXT DAY . . .**
THE PLACE: LOCKPORT FELT'S HOME OFFICE

Technician Buckley, returned with his findings, confers with Vice-President in Charge of Sales W. W. Campbell, Jr., Designer F. P. Heil, General Superintendent Howard F. Brown, Production Superintendent R. J. Capen (standing), and Assistant to General Superintendent Friedrich Troeltzsch.

This scene could be duplicated nearly every working day at the Lockport Plant . . . TENAX designers and production experts in the process of planning, designing, selecting correct yarns, setting up production schedules, mastering all of the myriad details involved in making TENAX FELTS. They have the same goal always . . . more paper at lower cost, with TENAX FELTS.

TENAX FELTS ARE FIRST IN SERVICE

LOCKPORT FELT CO.
NEWFANE, NEW YORK
TENAX FELTS

PULP & PAPER

Production and Management Magazine of the Industry

November, 1954
Vol. 28—No. 12

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COMMENT

Since 1926, Rayonier Has Gone Long Way

Fourteen years ago, this magazine published what was labeled on its cover page: *"FERNANDINA NUMBER."*

This was the Feb. 1940 issue and 40 pages of that issue were devoted to the story of Rayonier Inc.'s first mill in the South, headed "The First Bleached Sulfite Pulp Mill in the South."

There were 102 interesting photographs of that mill and its equipment shown with that story. Not counting personnel pictures.

That issue was the pathfinder and precursor for the nationalization and internationalization of PULP & PAPER. The magazine was launched in 1927, concurrently with the development and building of the market pulp industry on the Pacific Coast, which now serves hundreds of paper mills, rayon, acetate and cellophane plants.

PULP & PAPER'S editor traveled from Seattle, Wash., to Fernandina, Fla. in 1939, for its first major story away from the old base of operations. Incidentally, this still stands as the first story ever written in such detail about a Southern mill and the only one ever written on this Fernandina mill.

An interesting sidelight—that story carried pictures of then Vice President Clyde Morgan, now president of Rayonier; Dr. R. M. Pickens and Dr. Art Parrett, then technical and research chiefs, respectively, and now vice presidents, still working closely together; and James Sheehy, who was then assistant chief chemist at Fernandina and is now executive vice president in New York. A half dozen others, still with Rayonier, were in the pictures, including A. G. McArthur, still woodlands manager in the Southeast, but now for two mills.

Proudly, PULP & PAPER presents another carefully, thoroughly prepared story in this issue, on the newest of five Rayonier mills. This one is in Georgia, only 100 miles from Fernandina. This time PULP & PAPER editors only had to travel from Chicago, its editorial headquarters, and from New York City offices, to get this new Rayonier story.

Good News in Business Week

There is good news in a factual detailed report on the pulp and paper industry which was published in the Sept. 11 issue of *Business Week*.

For one thing, it emphasizes a point that persons close to this industry have known for a long time: "The feast-or-famine label has been snipped off the paper industry by its postwar performance. . . Since 1946, capacity has been increased 30.5%, production is up 43%, running this year at 90% of capacity. . . the industry is not worrying about its supply of pulping wood. But it is planting about 500,000 acres a year just to ease the heavy postwar inroads. . . investors have done rather nicely. . ."

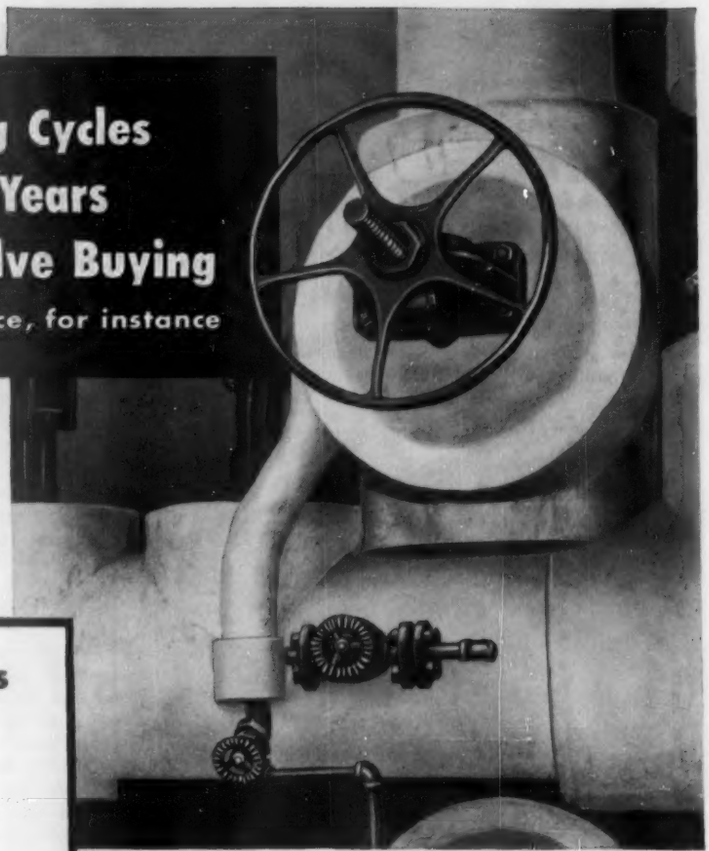
The article was optimistic as to the future. It made the point that this is a "growth" industry.

★ ★ ★

WHAT WITH GREETING CARDS designed for almost every conceivable occasion, these days, it's little wonder that their sales in the United States have soared to an average of ten million a day.

1248 Operating Cycles Through 24 Years Prove Quality Valve Buying

. . . for main steam service, for instance



The Installation

At the Champion-International Paper Mill, Lawrence, Mass., featuring Crane 400-pound steel gate valve in main steam line to turbine. Working pressure: 400 psi at 600 deg. F.

Valve Service Ratings

SUITABILITY: Never a question

FEATURES: Quality throughout

MAINTENANCE COST: Not a cent

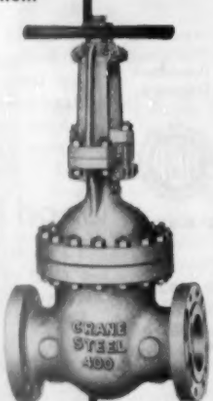
SERVICE LIFE: 24 yr.—still in line

OPERATING RESULT: Lower power costs

AVAILABILITY: Regular Crane Catalog item

The Valve

Improved constantly through the years, Crane steel valves for elevated pressures and temperatures are known and respected everywhere for outstanding, low-cost performance. They're made in the widest range of body and trim materials—in all pressure classes and sizes—with screwed, flanged, or welding ends. See your Crane Catalog, or consult your Crane Representative.



The Case History

Installed in 1930, this Crane valve has been in continuous use ever since. In 24 years the valve has not required service or maintenance of any kind.

More significant is the quality of performance of this 8-in. steel gate valve. Operated for week-end shutdown of the turbine, it has never failed to respond to the handwheel with smooth, steady action. Both seating and stem seal remain as tight as when the valve was first installed.

Performance like this begins in just one way—by making quality the first consideration when buying valves. Today, such a buying policy is sounder than ever and Crane quality, more than ever, helps assure the best results at lowest ultimate cost.

THE BETTER QUALITY . . . BIGGER VALUE LINE . . . IN BRASS, IRON, STEEL

CRANE VALVES

CRANE CO., *General Offices:* 836 S. Michigan Ave., Chicago 5, Illinois
Branches and Wholesalers Serving All Industrial Areas

VALVES • FITTINGS • PIPE • PLUMBING • HEATING

For makers of Quality Papers

ALBACEL

BLEACHED PINE SULPHATE
BLEACHED WITH CHLORINE DIOXIDE

Created by Papermakers for Papermakers

Albacel is a bleached pine sulphate . . . the cleanest pulp of its kind available from any source. Chlorine dioxide bleaching gives it outstanding strength and excellent brightness.

Albacel is produced at Riegel Carolina's new pulp mill at Riegelwood, N. C., with every refinement and control known to modern pulp manufacture.

Riegel Carolina Pulps

ALBACEL • SUPER ALBACEL • ASTRACEL

Created by Papermakers for Papermakers

RIEGEL PAPER CORPORATION • 260 MADISON AVENUE • NEW YORK 16, N. Y.

PULP & PAPER PERSONALS

NORTHEAST NEWS

Ed Alderson Moves; Miss Wright with Aco

ED V. ALDERSON, who has covered New England for Heppenstall knives for seven years from Hartford, Conn., has moved to Pittsburgh, Heppenstall headquarters. He still will cover his New England territory from there.

MISS MARGERY L. WRIGHT, secretary of Bagley & Sewall before it was sold to Black-Clawson, continues with Abe Cooper in a similar capacity in his Aco Machinery Co., Watertown, N.Y., which he formed in 1940 and will continue to operate.

ROBERT L. THOMPSON, long-time treasurer with Bagley & Sewall, will remain in that capacity in the new B & S Division of Black-Clawson.

RAY HATCH, director of research for Hudson Pulp & Paper, and formerly for the Pulp Div., Weyerhaeuser Timber Co., has been transferred to Hudson offices in New York City from Palatka, Fla.

FRANK L. CESSNA, Jr., recently joined New York & Penn at Lock Haven, Pa., as chemist. He attended Syracuse University.

LAWRENCE F. WHITTEMORE, president and chairman of the board, Brown Co., announces appointment of A. E. **HAROLD FAIR,** from Toronto, to the newly created position of executive vice president.

HENRY F. HARRISON, a former vice president and director of West Va. Pulp & Paper Co., died Sept. 27.

DONALD A. FRASER has joined J. Westergaard & Co., according to J. **WESTERGAARD.** Mr. Fraser was previously associated with Pagel, Horton & Co., Inc., Soundview Pulp Co. and Fraser Companies, Ltd.

SEYMOUR M. BARER has been appointed as chemical engineer in the engineering dept., Foster D. Snell Inc.

ROBERT GRANT HITCHINGS of Syracuse, N.Y. has been named assistant professor of pulp and paper technology in School of Forestry at N.C. State College.

KENNETH W. MATHESON, Assistant to the General Manager, Fraser Companies, Ltd., recently took his wife, Nita and their eight year old boy, Neal, trout fishing on Lake Anna, P.Q. All three returned with over 30 trout ranging in size up to 23 in.

GEROULD T. LANE, assistant general manager, Kodak Park, Eastman Kodak Co., and a 40-year veteran in this industry, retired recently. After graduation as a chemist from MIT in 1931, he served as assistant supt. with Rising Paper Co. until 1918 when he joined Kodak to take charge of their newly completed full-scale paper mill. He pioneered the substitution of wood fibers for rags in photographic paper.

LOUIS K. EILERS became assistant general manager of Kodak Park Works, succeeding Mr. Lane. **AUSTIN J. GOULD,** formerly assistant manager of film manufacturing, is new administrative assistant to the Vice Pres. **IVAR HULTMAN,** general manager at Kodak Park. **RICHARD M. WILSON** becomes assistant manager of film manufacturing.

FRASER MEN IN NEW POSTS

(L to r) VERNON H. EMORY, now Mgr. of Mfg., Pulp and Paperboard, Fraser Cos. Ltd. and subsidiary companies; W. A. (BILL) KETCHEN, named to newly-created position of Tech. Dir.; Dr. AL J. COREY, new Chief Chemist; KARL PATRICK, Asst. Chief Chemist; WALTER H. BIRCHARD, Chem. Engr., Special Assignments Tech Dept.

NEW POSTS IN MINNESOTA

HAROLD ZIGMUND (left) is newly appointed Assistant to Vice Pres. and Gen. Mgr. Myles Reif at Blandin Paper Co., Grand Rapids, Minn. Mr. Zigmund formerly was Pulp Mill Supt. at Mosinee Paper Mills. He had been there over 4 years since graduating in 1950 from the paper technology course at Syracuse U. He was born in New York City and served 6 years in Army Engineers, coming out as a Captain.
WILLIAM H. SCHLAFGE (right), former Prod. Mgr. for Paper, is now Gen. Mgr. of the entire International Falls, Minn., Division, according to Clarence Larson, Vice Pres. for Production. Mr. Schlafge has been with Mando 24 years, starting as chemist. He was born in Minneapolis.

J. H. COMPTON, Jr., sales engineer for Georgia Kaolin Co., Elizabeth, N.J., is getting back the use of an arm that he recently broke. Like a lot of good housekeepers before him, he did it when he fell off his house while painting it.

AL D. WILSON, JR., whose dad is editor of the Warren Standard, employee magazine of S. D. Warren Co., was recently married to Suzanne Hilty, Dayton, O. He is a college senior at Bowdoin College.

T. RICHARD PROBST, vice president and manager of mills, Eastern Corp., has announced the appointment of **J. G. L. "TOM" CAULFIELD** to technical director and **JOHN C. CONDON** to purchasing agent and traffic manager.

W. MALCOLM ORCHARD has joined Downingtown Mfg. Co. as sales engineer.

MIDWEST NOTES

John Spalding Succeeds Roy Kelly in Marathon

JOHN E. SPALDING has succeeded **ROY H. KELLY,** retired, as chief paper mill superintendent for all Marathon Corp. mills. From Watertown, Mass., a graduate of MIT, Mr. Spalding was a research and teaching assistant at the Institute in Appleton from 1934-7. He was with Oxford Paper and American Viscose before joining Marathon in 1947. He moved to Menasha, Wis., from Oswego, N. Y., where he was general supt.

Continued on page 10

Monsanto Paper Chemicals:

Mersize Reduces Fiber Flocculation, Improves Paper Quality

The wild formation and foam spots in the poor quality paper above are often caused by air in the stock. Air floats fibers to the surface and they gather in troublesome flocs. High foam index sizes, by stabilizing air in the stock, accentuate the problem.

If you're having formation and other foam troubles, switch to Mersize. It reduces foam at every point in the papermaking process ... and, at the same time, gives you the benefits of high sizing efficiency, low sizing cost.

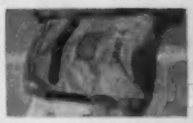
Let Mersize PROVE why it is earning ever-increasing acceptance. Order a tank car today for use under your own production conditions.

Write us for information. MONSANTO CHEMICAL COMPANY, Organic Chemicals Division, Box 478, St. Louis, Missouri.

Mersize helps solve these foam problems...

- Beater Swelling
- Foaming at the Screens
- Foam in the Headbox
- Fiber Flocculation
- Stock Pump Binding
- Foam in the Wire Pit
- Foam in the Vats
- Foam at the Save-All
- Foam at the Mixing Box
- Foam at the Seal Box
- Foam Spots in the Paper

Mersize: Reg. U. S. Pat. Off.



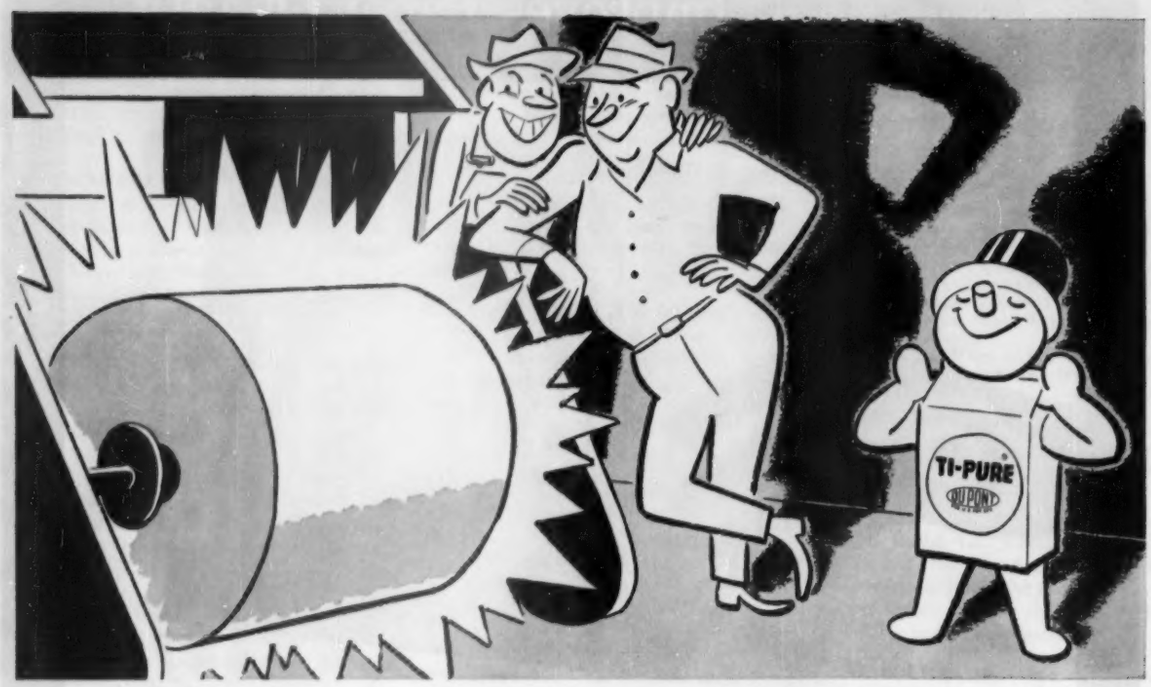
New! Mersize RM Dry ... Now Available

... completes the line of paste and dry fortified sizes offered by Monsanto, the originator of fortified sizes.

MONSANTO

SERVING INDUSTRY... WHICH SERVES MANKIND

"Radiant smiles are a common sight Since Ti-Pure® made their paper bright!"



Mill owner Moffit was feeling quite weary,
"There's simply no profit in paper that's dreary!
What filler will give me the brightness I want?"
When onto the scene stepped TI-PURE of DU PONT.

"Moffit," said TI-PURE, "you really should see
How I can make paper as bright as can be.
I'm a tried and true pigment, a real thoroughbred;
With me in your beater, you'll be out of the red!"

So Moffitt used TI-PURE in his next batch of paper,
With such brilliant results, he started to caper.

MORAL:

Why you should use TI-PURE is quite plain to see:
It gives whiteness...and brightness...and opacity!

• • •

Du Pont now offers a direct-to-you field service on TI-PURE titanium dioxide pigments. Technical experts, backed by a modern paper laboratory, will be glad to help you with your pigmenting problems. Call our nearest office for details.

PROMPT, NATION-WIDE SERVICE THROUGH THESE DU PONT DISTRICT OFFICES* AND WAREHOUSES:

Atlanta, Ga.
*Chicago, Ill.
*Cleveland, Ohio
Dallas, Texas
*Detroit, Mich.
*Houston, Texas
Indianapolis, Ind.
Kansas City, Mo.
Lockland, Ohio
Louisville, Ky.
*Malden, Mass.
Minneapolis, Minn.
New Orleans, La.
*New York, N. Y.
*Pasadena, Calif.
*Philadelphia, Pa.
*Portland, Ore.
St. Louis, Mo.
*San Francisco, Calif.
Seattle, Wash.

DU PONT

Ti-Pure®
TITANIUM DIOXIDE

TI-PURE gives your paper:

WHITENESS. Lasting whiteness in food wraps and containers, waxed board, glassine, and parchment.

BRIGHTNESS. Permits sharp reproduction of printed matter in porous papers, such as magazine and book stock.

OPACITY. No "show-through" in lightweight papers, envelope and stationery stock.

BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

E. I. DU PONT DE NEMOURS & CO. (INC.), PIGMENTS DEPARTMENT, WILMINGTON 98, DELAWARE

Dynamatic Eddy-Current Units can be put to work in your plant or product

This Free Booklet Will Show You How

Dynamatic eddy-current couplings, brakes, clutches, dynamometers, and Ajusto-Spede drives, in use today in practically every basic industry in both plant equipment and end products, are proving the ideal solution to difficult speed control and testing problems. Advantages include instantaneous response, infinitely adjustable speed control, wide speed range, quiet operation, low power loss, low maintenance cost, adjustable speed from an AC power source.

Our new booklet "Bulletin GB2" describes and illustrates the basic Dynamatic eddy-current units, including the new stationary field coupling. The text, augmented with illustrations and graphs, describes the basic eddy-current principles and drive characteristics. If you are interested in modern speed control, write for your copy of the new Dynamatic Bulletin GB2.

DYNAMATIC® DIVISION

EATON MANUFACTURING COMPANY

KENOSHA, WISCONSIN • General Offices: Cleveland, Ohio

PERSONALS — Continued

MIDWEST NOTES

JOHN T. MOSS, Midwestern district sales manager for Pusey & Jones Corp., and his wife, Estelle, are finding Michigan to their liking. The former Wilmington couple have their home at 409 Monroe St., Kalamazoo.

BILL GOODWILLIE, Beloit v. p., and his wife had a busy time lately with a daughter getting married in New York and to Europe for her honeymoon.

JOHN P. BAINBRIDGE JR., special technical representative for Monsanto Chemical Co., an MIT man, formerly based in Boston, has established new headquarters in Kalamazoo. He and his wife, Betty, have a home there at 310 Burrow Rd.

DAN SHEDD, another Monsanto man from Boston, has been in Appleton for some time now, and he and his wife, Priscilla, live at 2017 No. Union St. He is from Purdue and MIT.

CLEANER WOOD WITH LESS MAINTENANCE

MADE IN 6 SIZES
10' by 30'
10' by 40'
12' by 30'
12' by 45'
15' by 45'
15' by 60'

Murco
PLATE-SHELL TYPE
BARKING DRUM

USES LESS POWER . . . MINIMUM BRUISING AND BROOMING

The smooth interior of the MURCO plate-shell type barking drum, with or without sprays, delivers cleaner wood because there is only a minimum of bruising and brooming. In it true barking action comes from the friction of log against log, so there is no loss of wood and there is no dirt retention. Heavy duty rugged design, MURCO plate-shell barking drum utilizes only a few lifters strategically located to stir the load occasionally to accomplish proper barking action.

Tell us the size, type of wood to be barked and production requirements . . . we will submit recommendations and complete proposal.

MURCO

D. J. MURRAY MANUFACTURING CO.
MANUFACTURERS SINCE 1883
WAUSAU, WISCONSIN

101 MAN-YEARS WITH CONSOLIDATED

This trio averages over 33 years in service of Consolidated Water Power & Paper Co., and nearly all at Appleton, Wis., Interlake mill, where they are now. L. to r.: THEO W. FRANK, Bleach Plant and Machine Room Supt., "baby" of the group, who started there in 1923; ARTHUR H. BUNKS, Production Mgr., and employed there since he came out of service in 1919; and FRANK ALDRICH, Sulfite Supt., another 1919 joiner of Consolidated, but he did not get to Appleton until 1927.

JOHN WOOD, who heads up manufacturing for KVP Co., Parchment, Mich., has rounded out 30 years with that firm. **CLARENCE WARNER** and **HENRY VEROW**, Machine Room 2 machinetenders at KVP, both were recently retired and their mill associates presented them gifts. Complete fishing outfit went to Mr. Warner. A crew from KVP went to a hospital where Mr. Verow is a patient to present him a tv. set.

C. H. SAGE, vice president of Kimberly-Clark Corp., accompanied by Mrs. Sage, paid a visit to British Columbia in September.

IN EAST & MIDWEST

AMOS GOOD is new sales representative for Cameron Machine Co., covering Mid-Atlantic states, according to E. J. WARD, Sales Manager. He was formerly with Sandy Hill Iron & Brass Works. NORM NUTTALL (right) has been named Special Technical Rep. for The Hubinger Co., starch manufacturers of Keokuk, Ia. He will work on starch uses in paper and corrugating manufacture, fields in which he has had long experience.

Continued on page 14

THE MEAD SALES COMPANY
230 PARK AVENUE, NEW YORK 17, N. Y.
20 NORTH WACKER DRIVE, CHICAGO 6, ILL.

MEAD
pulp

DISTRIBUTORS OF WOOD PULP
BLEACHED AND UNBLEACHED
CHEMICAL AND MECHANICAL WOOD PULP

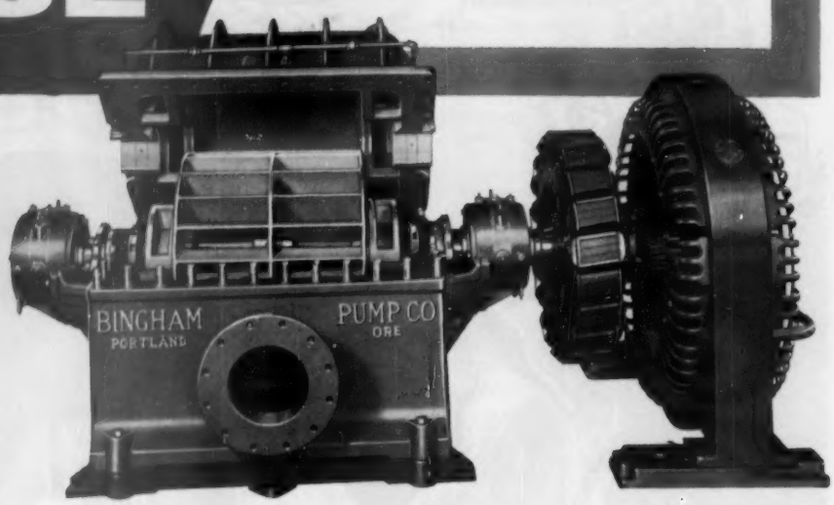
Paul Bunyan's reforestation program got going great guns when Paul decided to don spiked shoes and tramp over a logged-off area while his helpers set a seedling in every spike mark. Took 500 men to keep up with him.

A reproduction of this incident from the fabulous life of Paul Bunyan—the seventy-ninth of a series—will be sent on request. It will contain no advertising.

THE

Bingham SPLIT CASE

makes the BIG difference in Vacuum Pumps



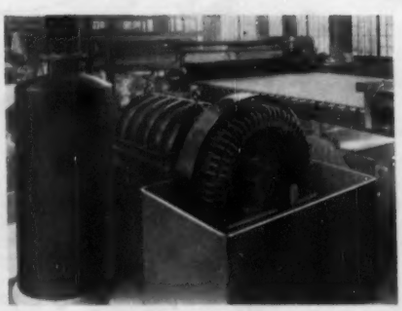
- **Higher efficiency— lower power costs— no contact between internal working parts.**
- **Quiet operation— no vibration.**
- **Less floor space required.**

in better accessibility, low maintenance, no drumming

Bingham Vacuum Pumps offer operating advantages that are possible *only* with the horizontally split case, an exclusive Bingham feature.

The horizontally split case, permitting removal of top half, makes it easy to inspect or remove rotating element as a unit, in minimum floor space, and without disturbing suction and discharge piping connections.

Write your nearest Bingham office for further information, or give details of your operation. Bingham engineers will be glad to make recommendations with no obligation on your part.



One of several Bingham split case, double suction, vacuum pumps in Weyerhaeuser's pulp mill, Everett, Washington.

Bingham PUMPS
SINCE 1921
DOUBLE VOLUTE
RADIAL BALANCE

BINGHAM PUMP COMPANY
General Offices: **2800 N.W. Front Avenue, Portland 10, Oregon**
Factories: **Portland, Ore. • Vancouver, B.C., Canada**

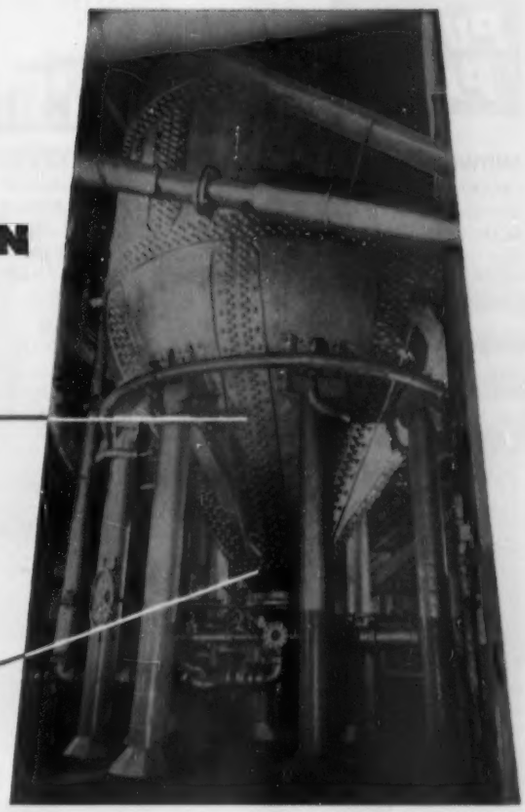
SALES AND SERVICE OFFICES

BOSTON, MASS.	SAN FRANCISCO, CALIF.
CHICAGO, ILL.	SEATTLE, WASH.
DENVER, COLO.	ST. LOUIS, MO.
HOUSTON, TEXAS	ST. PAUL, MINN.
KANSAS CITY, MO.	TULSA, OKLA.
NEW YORK CITY, N.Y.	TORONTO, ONT., CAN.
PITTSBURGH, PA.	VANCOUVER, B.C., CAN.

MORE PULP
PURER PULP
...LOWER COSTS PER TON

with

AMMONIUM Bisulfite Pulping



• **More pulp**—a higher proportion of acceptable pulp of increased freeness is produced, thus increasing the capacity of knotters, deckers, washers and fine screen equipment.

And here are some additional reasons why leading mills have converted to the high-production, low-cost Ammonium Bisulfite Pulping process using Barrett® Brand Anhydrous Ammonia:

• **Better quality**—unbleached pulp is more uniform, stronger, brighter; has lower ash and lower screened speck count. Less bleach needed.

• **Saves steam**—superior penetration reduces cooking time and maximum temperatures. Temperatures are lowered as much as 30°F!

• **Saves labor**—one ton of ammonia replaces *three* tons of limestone. Handling of limestone, scaling is eliminated.

• **Overcomes steam pollution**—waste liquor is *easily evaporated;* there is a greater recovery of heat and chemicals; while steam pollution is reduced to a minimum.

The changeover to this Pulping Process—pioneered by us—is inexpensive. A minimum replacement—and in many cases no replacement—of equipment is involved, and there is practically no loss of production during conversion.

Why not wire, phone or write us today? A member of our Technical Service staff will call, give you full details, facts and conversion methods. No obligation!

NITROGEN DIVISION ALLIED CHEMICAL

Anhydrous Ammonia

NITROGEN DIVISION

ALLIED CHEMICAL & DYE CORPORATION
40 Rector Street, New York 6, N. Y.
Ironton, Ohio • Orange, Texas • Omaha, Nebraska

Ammonia • Sodium Nitrate • Urea • Ethylene Oxide
Ethylene Glycol • Diethylene Glycol • Triethylene Glycol • Methanol • Formaldehyde • Nitrogen Tetroxide • U.F. Concentrate—85 • Nitrogen Solutions • Fertilizers & Feed Supplements

NITROGEN DIVISION, ALLIED CHEMICAL & DYE CORPORATION
40 Rector Street, New York 6, N. Y.

☐ Yes, please send me full details on your Ammonium Bisulfite Pulping Process.

☐ Please arrange to have your Technical Service Man call! No obligation.

Name_____

Title_____

Company_____

Address_____

City_____ Zone___ State_____ PU-11

PERSONALS — Continued

MIDWEST NOTES

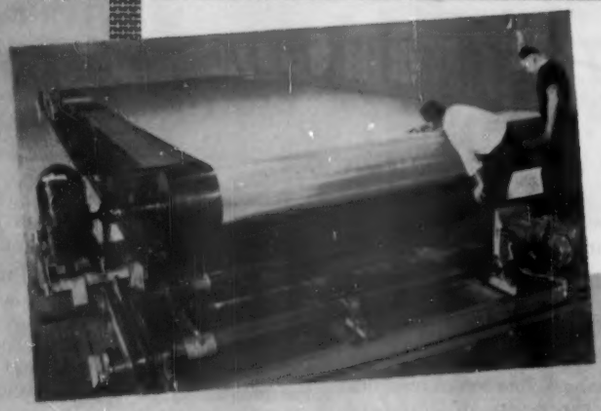
CHARLES HOLMES, Kimberly-Clark, Neenah, has succeeded **GREGORY SCHULTE**, Valley Iron Works, as president of the North Wisconsin Cost Accountants Assn. chapter. **ELMER DEPREZ**, John Strange Paper, is treasurer.

JACK HAYES, president of Appleton Mfg. Co. scored a gross 71 to win the golf at the Breezy Point meeting this fall, but he graciously declined the prize.

FRED KRANHOLD, former general superintendent of all Kimberly Clark mills, who was with Kimberly-Clark for 54 years, wants his old friends to know that at 78 he goes fishing, mows his lawn in Appleton, and is now a grandfather 22 times and great-grandfather 6 times.

WESTBROOK STEELE, president of the Institute of Paper Chemistry, left for a visit to his home in Vermont after the Fundamental Research symposium.

Two of the Men Behind Eastwood Wires



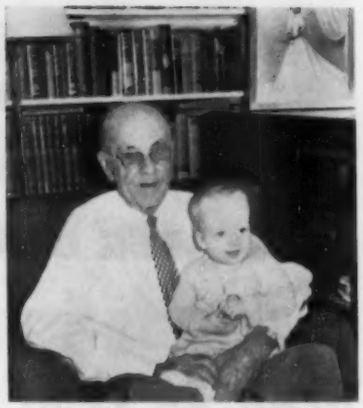
FINAL EXAM

Here James Baney and Clarence Reed are making a final, inch-by-inch examination of a large fourdrinier wire. Though this is a final check, it is only one of many given it at every stage of its manufacture, from the casting of the alloys in our own foundry to the stretching table inspection shown above.

Because the Eastwood-Nealley plant is a *completely integrated* operation, every wire we ship has undergone thorough and continual analysis, control and testing from the raw metals to your finished fourdrinier wire ready for quality paper production.

We are proud to say they are *truly ours* — "from ingots to fourdrinier wire".

EASTWOOD-NEALLEY CORPORATION
Belleville, N. J.



A HAPPY DAY FOR McMAHON

CORMAC J. (MIKE) McMAHON, Midwest rep. for many years for Appleton Woolen Mills, is pictured here with grandson, MICHAEL PATRICK O'MALLEY, just a few hours after they met for first time, 10 months after little Mike was born in Germany. His father is Capt. Pat O'Malley of Rhinelander, and mother, former Gertrude McMahon, former Secy. to Pres.. of Institute of Chemistry. Her wedding picture is seen in background.

PHILIP LA TENDRESSE headquarters in L'Anse, Mich., where he is general mgr. of research and development for La Tendresse division of Pettibone-Mulliken Corp., manufacturers of pulpwood handling equipment.

HORACE BRUNNER is new assistant manager for Wyandotte Chemicals Western district, in the Chicago office at 435 No. Michigan. He is a former New Jerseyite, was manager of the Detroit office and also manager of distributor sales.

BECKER JOINS LEWIS CO.; WESTBROOK IN NEW POST

J. EDMUND BECKER (left), is new Production Mgr. for J. P. Lewis Co., Beaver Falls, N. Y., Pres. James P. Lewis advises PULP & PAPER. Mr. Becker has charge of production and quality control at both the Beaver Falls mill and newly acquired Brownville Board Co. He was Prod. Mgr. at Alton Box Board Co., Alton, Ill., and before that was with Chase Bag and International Paper.

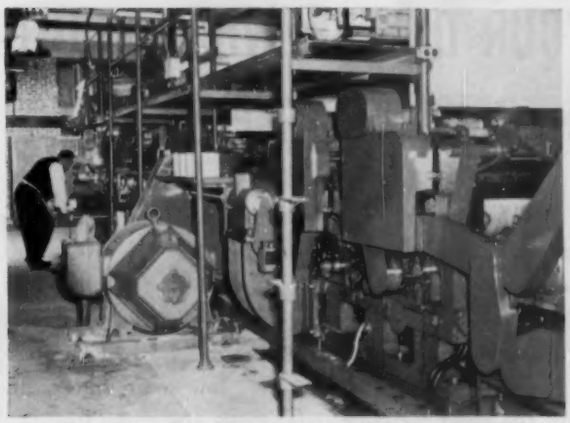
U. J. WESTBROOK (right), is new Supervisor of all St. Regis pulp mills. He has been Production Mgr. for the Jacksonville and Pensacola divisions.

Continued on page 18

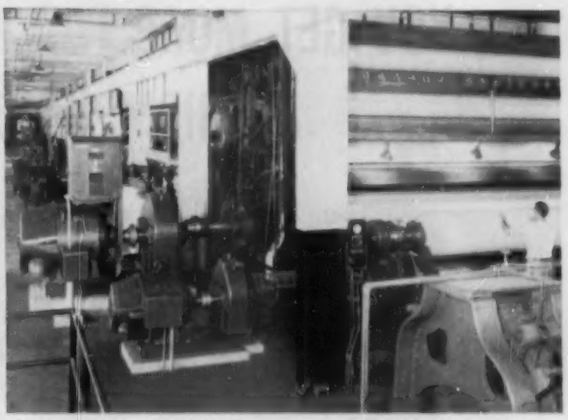
BUILT AND APPLIED BY RELIANCE

THE *Tools of Automation*

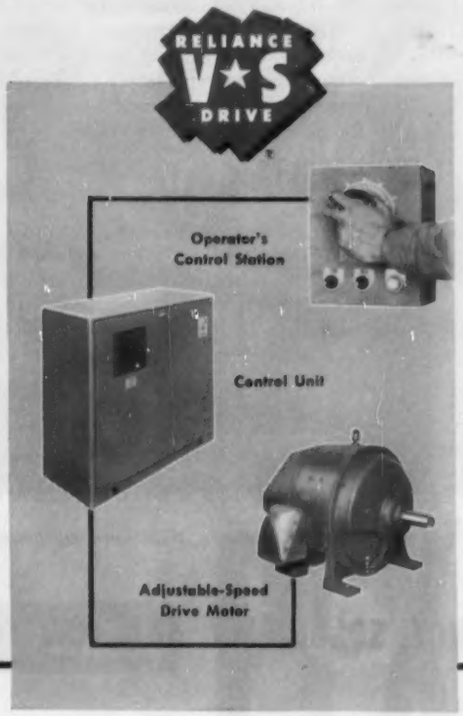
INCREASE PROFITS IN EVERY INDUSTRY



Materials in web form—paper, metal foils, synthetic sheets—become useful as they are impregnated, combined with each other, printed, and made into packages. Reliance V★S Drives power, synchronize and control all functions required for automatic operation.



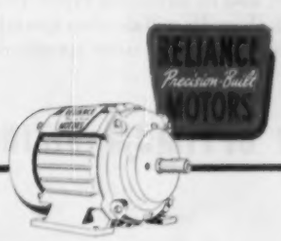
On a high-speed newsprint machine, the Reliance V★S Drive system provides unsurpassed accuracy and dependability, maintaining precise speed relationships and correct draw adjustments between all sections.



Greater machinery output . . . improved production efficiency . . . both result in increased profits. And both result from using the Tools of Automation: Reliance electric motors, adjustable-speed drives, electronic controls, and applied engineering. They're setting new standards for low cost production in *every* industry.

These Tools of Automation can most efficiently lower your costs, because they're designed and applied to *your* specific situation. Reliance Application Engineers are backed by nearly 50 years' experience in perfecting the drive systems that can help you attain the degree of automatic production you require. For further information, write for the new booklet, "The Tools of Automation".

A-1487-B



RELIANCE ELECTRIC AND ENGINEERING CO.

Sales Representatives in Principal Cities • 1105 Ivanhoe Road, Cleveland 10, Ohio

CUT YOUR BILLS TO

YOU GET MORE FOR YOUR DOLLAR WHEN YOU ORDER A SHIPMENT OF PEXOL FORTIFIED SIZE

There are many good reasons why Pexol outsells any other fortified size on the market. Not the least of these is Hercules' unequaled service facilities, which provide every Pexol user with the advantages of a product tailored to his needs. Hercules' technical representatives, trained for service to the paper making industry *exclusively*, are available to visit your plant, study your operating conditions, and recommend a Pexol formulation that will give optimum solubility, overall sizing efficiency and low foam index. Such service is a Hercules "plus"—insures the most for your sizing dollar *in actual use!*

FACTS ABOUT FOAM

There has been much comment about foam caused by rosin size. The simple fact is: **NO OTHER FORTIFIED SIZE HAS A LOWER FOAM INDEX THAN HERCULES PEXOL**, and at an equal degree of fortification no other size can even approach it.

RESEARCH FACILITIES

The finest research facilities possible, devoted exclusively to paper making chemicals and their application, are available in helping you improve your product or processing methods. Trained technicians in the laboratory back up Hercules' technical representatives in the field—put at your disposal over forty years of experience in solving paper making problems.

VARIETY

No one size, dry or paste, can possibly fit every requirement. That's why Pexol is available in both paste and dry forms, and in numerous types. Or, if your needs are unusual, Hercules will develop special modifications of existing formulations to meet specific conditions.

ECONOMY

Pexol brings reductions in size furnish . . . often as high as 30 to 50%. That means lower inventories, reduced freight and handling cost. Yet sizing tests are maintained . . . often improved. In every way, Pexol is a balanced fortified size that gives the most of all desirable properties—the most for your sizing dollar!

RESULTS

The final test of any size is how well it works for *you*. Pexol outsells all other fortified sizes. To maintain such a record, it *must* give results! If you're among the few who haven't yet tried Pexol, contact your Hercules technical representative. He'll be glad to demonstrate what you've been missing.

Paper Makers Chemical Department

HERCULES POWDER COMPANY

965 King St., Wilmington 99, Delaware

FOR OPTIMUM SIZING EFFICIENCY, SOLUBILITY, AND LOW FOAM INDEX . . .

SIZE WITH PEXOL

... HERCULES® **PEXOL®**

FORTIFIED SIZE

SOUTHERN NEWS

McCarthys Tour Europe; Big Leaguer "Pitches" in Mill

JUSTIN McCARTHY, chief engineer, St. Regis Paper Co., his wife, Elsie, and daughter were among industry folks who made the grand tour of Europe this year. Their home is Jacksonville, Fla.

GEORGE CHARTERS, retired assistant manager at Camas, Wash., has arrived in Evadale, Tex., helping his old comrade and longtime associate, ALBERT G. (BUFF) NATWICK, resident manager, to start up East Texas. Born in Wisconsin, Mr. Charters spent his early career in mills at International Falls, Minn., Grand Mere, Que., where he helped start and run the first 1,000 fpm machines, and as superintendent at Eddy Co., Ottawa, until he went to Camas in 1928 as assistant resident manager. Two sons are with Crown, one with Boeing, and a daughter is with United Airlines.

SULPHUR-DIOXIDE
HIGHEST QUALITY
SO_2
MAY PUT YOUR DUCKS IN A ROW!

CONTAINERS
- Cylinders
- Ton Drums
- Tank Trucks
- Tank Cars

Free Literature! Samples, Specifications and Detailed Information on Request.

Many industries with vision have lined up their problems with **Tennessee Corporation Sulphur-Dioxide.** In most cases a more advantageous and economical operation has been achieved through the use of this chemical (SO_2) with its extreme versatility. We can supply **Tennessee's** fine quality **Sulphur-Dioxide** in any desired quantities. Perhaps you have a specific process in which **Tennessee Sulphur-Dioxide** may increase your plant efficiency. Let our own technical experts advise you by writing for details.

TENNESSEE TC CORPORATION

617-629 Grant Building, Atlanta, Ga.

ZONNER GOES SOUTH; CARLETON STAYS ON

WILLIAM A. ZONNER (left), new President of Valentine Pulp & Paper Co., Lockport, La., newly completed cane bagasse pulp and paper mill built by Valite Corp. Mr. Zonner was Exec. Vice Pres. of Bagley & Sewall, now sold to Black-Clawson. Formerly he was with St. Regis and Consolidated Water Power & Paper and Appleton Machine Co. in a long career in this industry.

GEORGE N. CARLETON (right) has been elected Vice Pres. and Director of Scott Paper Co., as a result of the acquisition of Detroit Sulphite Pulp & Paper Co. by Scott. He had been President of Detroit Sulphite since 1944, and will continue to direct its operations as a Scott Division. Mr. Carleton started in 1927 with the Detroit firm in its extensive Ontario pulpwood operations. Its wood resources were a major attraction to Scott.

GEORGE GOUKER is new assistant supt., Fernandina, Fla., Div., Rayonier Inc., moved there from Port Angeles, Wash., where he was tech. asst. to sulfite supt. He graduated from Montana U. in 1937.

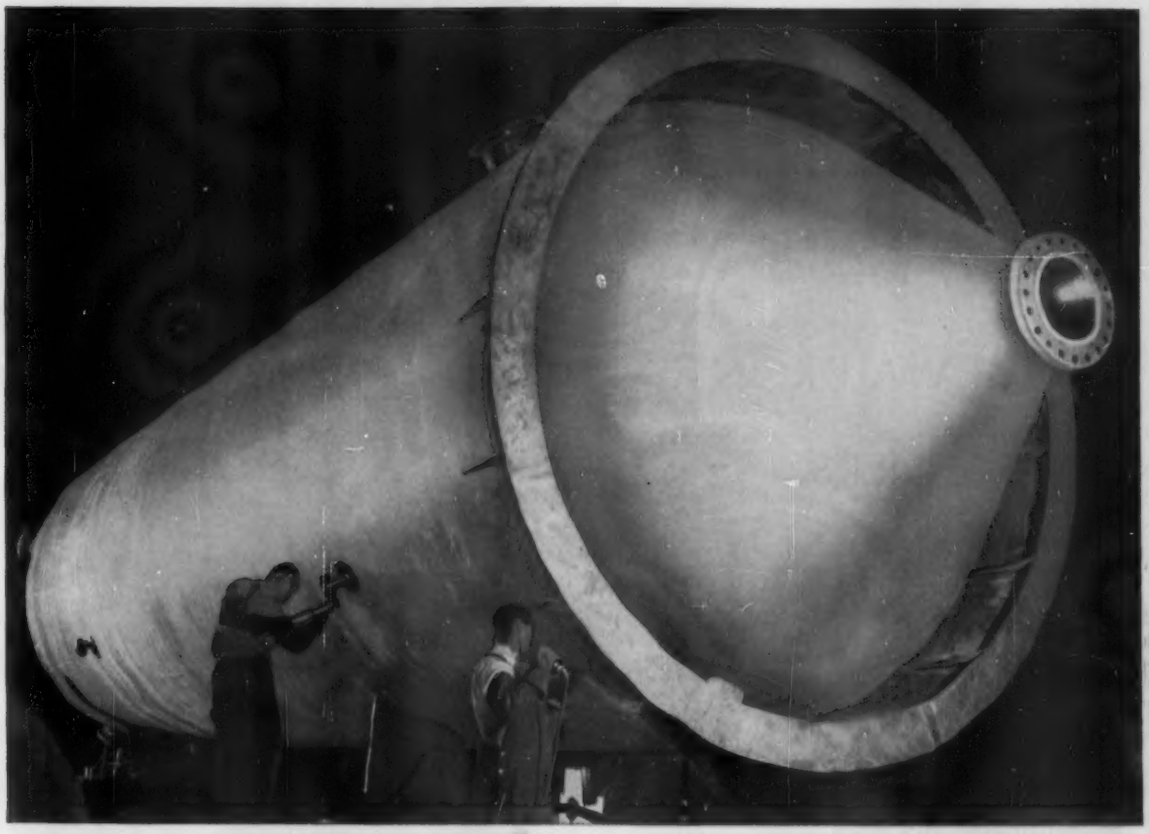
BILL HENRY, known by baseball fans as a pitcher with the Boston Red Sox, is working off-season in the laboratory for Champion Paper's Pasadena, Tex., mill. He was born in Houston.

LEWIS WITHAM, Ciba representative in the South, has been traveling from coast to coast for his New York company, studying its paper industry markets.

IN NEW RAYONIER POSTS

HARRY G. TAYLOR (left) has been appointed Chief Chemist at the Fernandina Div. of Rayonier, Inc., and E. P. (BUD) WILSON (right) has been named Assistant Chief Chemist at the same division according to FRED B. DOHERTY, Resident Manager.

Continued on page 22



Pulp digesters to improve the quality of tires

Installed in new plant to produce Chemical cellulose for Rayon cord

This is one of six, four SMITHlined and two clad digesters made by A. O. Smith for the new Rayonier Incorporated, Jesup Division installation.

It will produce chemical cellulose for rayon cord that will form casings for more economical, longer lasting automobile tires.

Lined with type 316 ELC stainless steel, these digesters are 12 feet in diameter, 55 feet high and are completely shop fabricated at our Milwaukee works.

A. O. Smith engineers have worked closely with Rayonier in the past. They assisted in designing, and built the world's largest digester for their Fernandina division, and supplied two for the Port Angeles, Washington, mill.

Now, when building a new plant, Rayonier comes, again, to A. O. Smith for digesters.

Close cooperation of our staff with members of the paper industry in solving digester corrosion problems benefits all concerned. This cooperation does not end with the installation of the vessel, but continues in the conduct of subsequent metallurgical inspections and the training of mill personnel to make their own inspections and to correctly evaluate vessel conditions.

If you are faced with corrosion problems arising from the use of pulping chemicals in digesters, we shall be pleased to assist you in solving them.

Your inquiry will receive prompt attention.

Through research ...a better way

A.O.Smith

PROCESS EQUIPMENT DIVISION
Milwaukee 1, Wisconsin

Chicago 4 • Cleveland 15 • Dallas 2 • Houston 2
Los Angeles 22 • Midland 5, Texas • New Orleans 12
New York 17 • Pittsburgh 19 • San Francisco 4 • Seattle 1
Tulsa 3 • Washington 6, D.C.
International Division: Milwaukee 1
Licensee in Canada: John Inglis Co., Ltd.

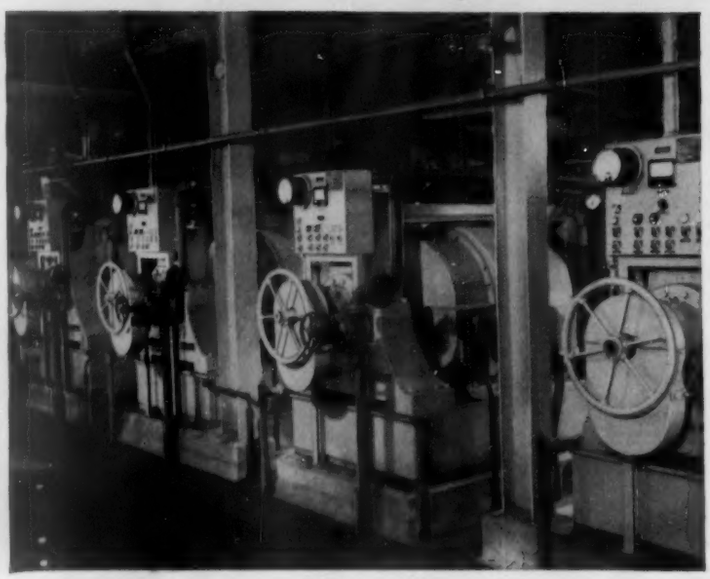
for economical SEMI-CHEMICAL *pulping*

AMERICAN BOX BOARD COMPANY

continually chooses

SPROUT-WALDRON

36-2 REFINERS



Four of the eight Sprout-Waldron 36-2 refiners at American Box Board Company, Filer City, Michigan. All eight units refine neutral semi-chemical chips for 9 point corrugating board in this most modern semi-chemical mill. Two were installed in 1948, one in 1949, four in 1952 and one in 1954. Repeat orders, such as this, are the best evidence of customers' satisfaction with Sprout-Waldron Refiners.

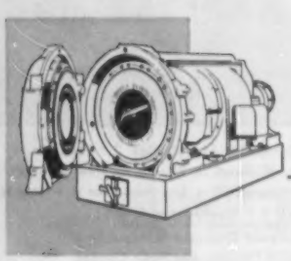
The SPROUT-WALDRON refiner is the leading producer of semi-chemical pulp

Single disc design, peripheral control ring and rugged construction for...

- **high pulp quality**
- **high capacity**
- **flexibility of operation**
- **low maintenance**

For more information on semi-chemical pulping, or any other pulping application, send for our file of technical and practical data. Write to Sprout-Waldron & Co., Inc., 32 Logan Street, Muncy, Pa.

S W



for your pulping problem—

SPROUT-WALDRON

PULP REFINERS

301

PUGET PULP—the *whitest, cleanest, bleached sulphite pulp* that we can make is produced *particularly for the market.* To assure converting mills of top quality, Puget management is always testing new processes, always alert to improved methods, always ready to install new designs in equipment. *Gear your operations to* ***PUGET PULP.***

PUGET SOUND

PULP AND TIMBER COMPANY

BELLINGHAM • WASHINGTON

CANADIAN NEWS

Grant Ross's Rare Hobby; How Avery Came "Home"

GRANT D. ROSS, manager of both the mill and town division, Marathon Mills of Canada, Marathon, Ont., enjoys a hobby which calls for unusual skill. He makes tiny scale models of old-time automobiles and stage coaches—and exactly to specifications. Among his models are a 1909 Stanley steamer, a 1906 Columbia electric, a 1904 Franklin, etc.

P. R. SANDWELL, Vancouver, B.C., head of the engineering firm bearing his name, circled the world in three weeks recently when he flew to Pakistan, where his company is working on a pulp mill project, and continued around the globe homeward.

RALPH B. BRENAN, managing director, G. E. Barbour Co., St. John, N.B., has been elected a director of Fraser Companies to fill the unexpired term of GEORGE E. BARBOUR, who resigned.

IF YOU WANT IT FABRICATED

NWC'S YOUR MAN

Northwest Copper Works is the pioneer fabricator of Stainless Steel for the Paper Industry... SERVICE is a by-word... FOLLOW-THROUGH is a Must... GUARANTEED SATISFACTION means what it says.

Jordan Head Box installed in a Pacific Northwest Pulp and Paper Mill.

Specializing in:

- Stainless Steel Products
- Stainless Steel Tubing
- Stainless Steel Valves
- Stock Valves
- Stainless Steel Fabrication
- Stainless Steel Fittings
- Stainless Steel Pipe
- Copper Smithing
- Lead Linings
- Lead Burning

NORTHWEST COPPER WORKS

1303 N. RIVER STREET
PORTLAND 12, OREGON

PHONE MURDOCK 2191

PROMOTIONS IN POWELL RIVER CO.

Promoted in Powell River Co. Engineering Department (l to r): HAROLD MOORHEAD, to head offices in Vancouver, B.C., with title Chief Engineer; D.H.R. (DON) BLAKE, to Resident Engineer at Powell River, succeeding Mr. Moorhead, and A. R. M. (RON) STEWART, to Plant Engineer at Powell River, with enlarged duties including all design work.

B. F. AVERY, president of KVP Ltd., has had the satisfying experience of coming back to old haunts to revive an industry he knew as a young man. His college vacations were spent at Espanola and he served in its woods department in the '20's and '30's. After an absence of about 10 years, he directed the reopening of the mill by KVP in 1946.

A. E. H. FAIR, Toronto, director of Howard Smith Paper Mills, Alliance Paper Mills, Don Valley Paper and Richmond Pulp & Paper Co. of Canada, has been appointed executive vice president of Brown Co. and its Canadian subsidiary, Brown Corp., with headquarters in Boston.

FLOM GOES TO D.C.; ROOT MOVES TO CANADA

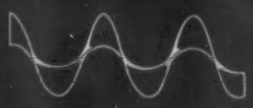
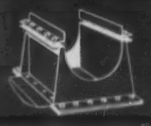
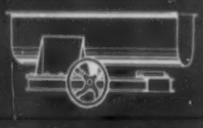
RUSSELL C. FLOM (left) is new Director of Forestry Products Division of Business and Defense Services Administration, Dept. of Commerce, in Washington, D.C. He is loaned until June next year by Marathon Corp., where he is Director of Pulp, Paper and Paperboard Sales. He has moved with his wife and son, Frederick, to Washington.

EDWARD M. ROOT (right) newly named Vice Pres. and Gen. Mgr. of new Canadian subsidiary, Black-Clawson (Canada) Ltd., of well known machinery manufacturing firm of that name. His offices are in Dominion Sq. Bldg., Montreal, P.Q. Mr. Root has been with B-C and its divisions for 24 years, recently for 4 years as Sales Mgr. in Atlanta, Ga.

Continued on page 26

When you buy screw conveyors... rate them against this quality chart

Only LINK-BELT gives you all these performance extras

ACCURATELY FORMED FLIGHTING		Link-Belt's specialized machinery assures accurate forming, producing uniformity of flighting curvature.
UNIFORM DIAMETERS		Only specially selected steels are used to meet Link-Belt's rigid specifications.
WIDE RANGE OF HANGERS		Hangers are available in a wide range of styles and mountings with various bearing materials.
EASY ASSEMBLY		Straightness is checked before shipping, and extra care is taken in handling and loading. Jig-drilled coupling bolt holes facilitate assembly.
ON-THE-JOB DISCHARGE OPENING LOCATION		For versatility in locating discharge openings, Link-Belt offers spouts and gates that can be easily installed on the job and bolted or welded in place.
CHOICE OF SPOUTS, GATES		Wide range of fixed or detachable plain discharge spouts or gates. Flat or curved slide type gates can be hand or rack-and-pinion operated.
FULLY INTEGRATED DRIVES		Only Link-Belt builds a complete, pre-integrated line of gear and chain drives, couplings, bearings. One proved source . . . one undivided responsibility.
ACCURATELY FABRICATED TROUGHS		Added refinements of manufacture assure better fit of all components. And Link-Belt offers you a choice of metals to fit your particular application.

These are only a few of the many important performance extras you get with Link-Belt screw conveyors. Ask your Link-Belt representative or authorized stock carrying distributor for 92-page Data Book 2289.

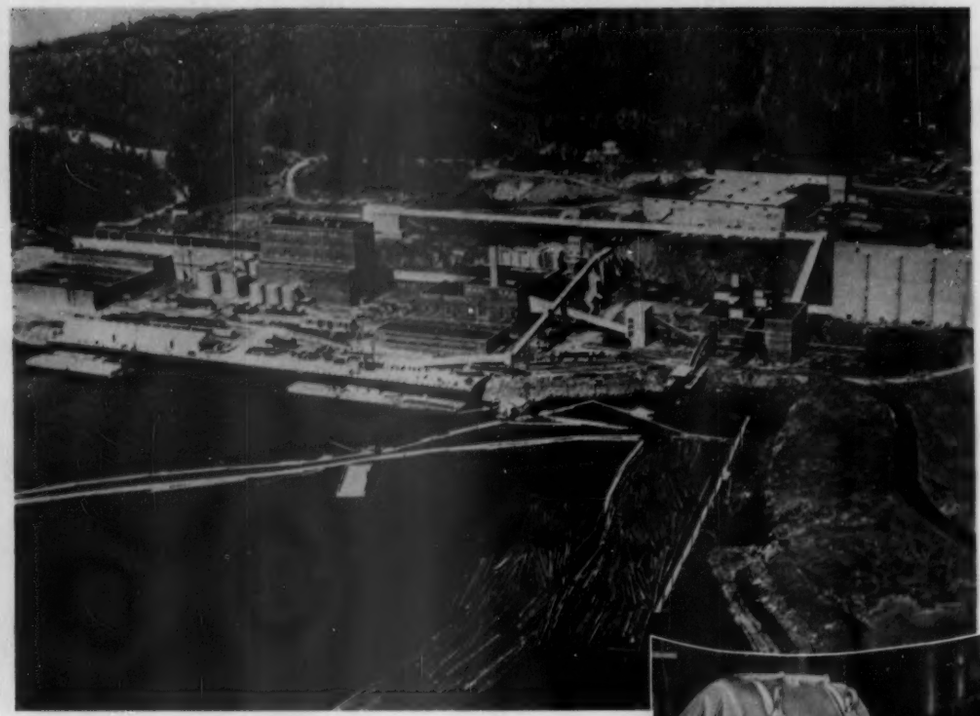
LINK-BELT

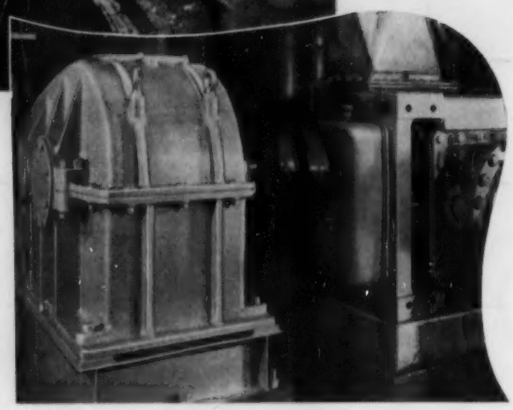
10,677

SCREW CONVEYORS

LINK-BELT COMPANY: Executive Offices, 307 N. Michigan Ave., Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World.

138 Western Gear Drives
selected for new Ketchikan mill





Aerial view of new Ketchikan Pulp Company mill at Ketchikan, Alaska. Inset shows close-up of one of 138 Western Gear drives used.

WHY? . . . because Western Gear drives have established an unequalled reputation for superior performance per dollar of cost. Its remote location forced the new Ketchikan Pulp Company mill, combined effort of the Puget Sound Pulp & Timber Company and the American Viscose Company, to insist on drives designed for automatic operation wherever possible and backed by utmost dependability. Specifications for equipment in the mill demanded latest in design with a proven reputation for efficiency and long life. All the drives requiring reducers from 2 HP to 1250 HP were supplied by Western Gear Works, from the log haul drives to the finishing room and in the yards and on the docks. In addition, Western Gear supplied what is believed to be the first positive drive two-speed log haul with remote pneumatic shifting control.

In the past four decades, Western Gear Works reducers and gear drives have become standard equipment in the mills of the Northwest and more Western Gear speed reducers are in use in these lumber, pulp and paper mills than all other makes combined.

Thos. J. Bannan, President

For information on how to solve your mill problems, write Western Gear Works, 417 Ninth Avenue South, Seattle 4, Washington.

5248

Since 1888

WESTERN GEAR WORKS

PACIFIC-WESTERN PRODUCTS | POWER TRANSMISSION GEARS • MACHINERY

PACIFIC GEAR & TOOL WORKS · SOUTH WESTERN GEAR WORKS

PLANTS AT LYNWOOD, PASADENA, BELMONT, SAN FRANCISCO (CALIF.)
SEATTLE AND HOUSTON — REPRESENTATIVES IN PRINCIPAL CITIES

your gear drives

GET PROTECTION PLUS...

with GULF E. P. LUBRICANTS

Gulf E.P. Lubricants do more than just prevent excessive gear wear. Their excellent water separating and rust preventive properties, their exceptional stability, and their nonfoaming and noncorrosive characteristics give your gear drives protection plus against lubrication troubles.

And it is often practical to use a Gulf E.P. Lubricant of lower viscosity than is possible with a straight mineral oil, which means that fewer grades of gear lubricants are required — your storage and handling is simplified.

The next time you order gear drive lubricants, make it an order for safe, sure protection—specify Gulf E.P. Lubricants.

For more complete information, or for expert help with your gear drive lubrication problems, send the handy coupon.

GULF OIL CORPORATION · GULF REFINING COMPANY
1822 Gulf Building, Pittsburgh 30, Pa.

PAP

Gentlemen:

I would like further information on Gulf E.P. Lubricants:

- ☐ Please have a Gulf Sales Engineer call.
- ☐ Please send me a copy of your pamphlet "Gulf E.P. Lubricants for Reduction Gear Drives."
- ☐ Please arrange to show a group in our plant the new Gulf Color Slide Film, "Gears and Their Lubrication."

Name_____

Company_____

Title_____

Address_____

GULF INDUSTRIAL LUBRICATION

CANADIAN NOTES

JIM LANE, veteran manager of Baie Comeau (Que.) Paper Co., was quoted recently in the Chicago Tribune (which owns the mill) in telling how **DR. DON THURBER,** Baie Comeau surgeon, once climbed over a dangerously shifting and settling pile of logs to amputate the leg and save the life of a crane operator caught in a huge tumbling log pile. Logs were still falling around him as he operated.

PACIFIC COAST NOTES

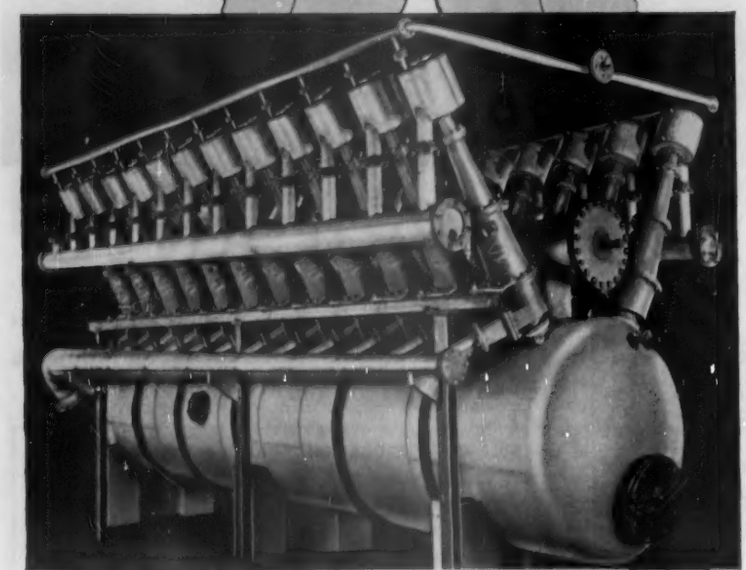
Shinn on Family Tour; Jacoby Is Honored

DALTON L. SHINN, of Crown Zellerbach central research, who gave a paper in the distinguished paper machine fundamental research sessions at the Institute in Appleton in September, made the round trip with his entire family by train, so his wife and children could visit her family in Racine, Wis.

DECULATOR-CLEANER

A GREAT STRIDE FORWARD

Along the Path of Improved Paper Making



With the advent of the Deculator-Cleaner, something has been added to the several production advantages enjoyed by the many paper mills already using The Deculator. Now you can clean your stock at the same time you deaerate it and use no more horsepower than is required for the cleaning operation alone.

THE ROTAREAED CORPORATION represented by

CLARK & VICARIO CO.

Bronxville, N. Y.

MOVE INTO IMPORTANT POSTS FOR ST. REGIS

PAUL M. DUNN (left), Dean of Forestry at Oregon State College since 1942, has resigned to become Technical Director of Forestry for St. Regis Paper Co. He has charge of technical forestry for all its forest lands, now over 2,000,000 acres, and for related forestry matters. He takes over Jan. 1. He previously had been Dean of Forestry at Utah State for 11 years, and prior to that was 5 years in Missouri state forest service.

FREDERIC C. GOODWILL (right) is new Resident Mgr. of the Bucksport, Me., mill, succeeding George D. Bearce, retired. A graduate of Pratt Institute, Mr. Goodwill has been Asst. to Vice Pres. W. R. Adams, and before that was Res. Mgr. at Kalamazoo. With St. Regis since 1928, he started at Deferiet as Chemist and later was Technical Director there.

WILLIAM R. GIBSON, veteran builder of water filtering plants for mills in the Far West whose death was reported last month, was buried in Oak Hill Memorial Park, south of San Jose, Calif., Mrs. Gibson wrote. She continues to live at Los Gatos, 11 miles from there.

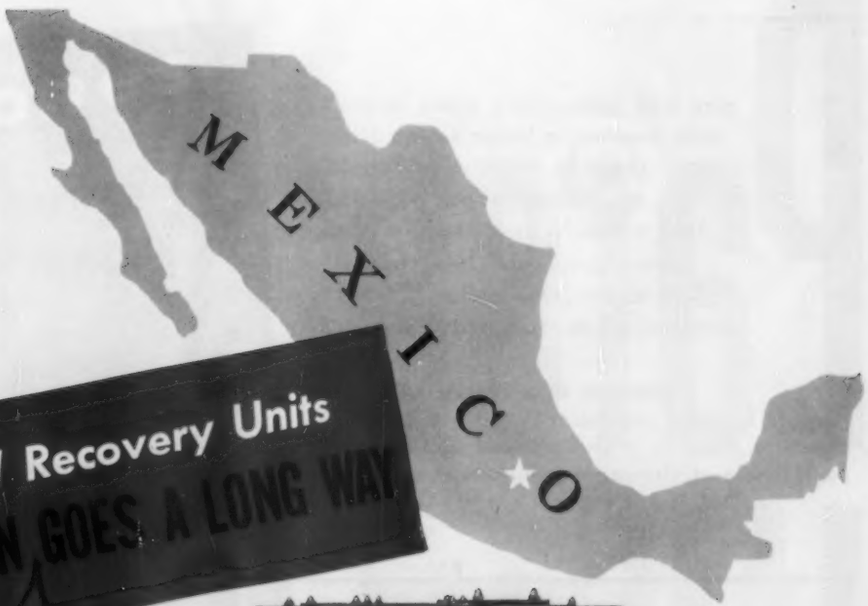
BOB OWENS, engineer, and **RAY HELGESON,** logging engineer, Fibreboard Products, Port Angeles, Wash., went to Canada for a week of trout fishing, bringing home more than 100. **BILL PAYNE,** backtender in the same mill, chose commercial deep sea salmon fishing as his vacation activity.

EDWIN A. WOODWORTH, Jr., senior engineer, Crown Z West Linn mill, is president of the Portland, Ore., Instrument Society chapter. **VERNON S. ROBYN,** Minneapolis Honeywell rep., is secretary.

BOB SMYTHE, of Ray Smythe Co. firm of Portland, Ore., and Mrs. Smythe again become parents for the fourth time—all boys—Sept. 11 with the birth of Daniel B. (initial only for "Boone"). Wife Elizabeth doing well.

DR. HENRY K. BENSON, retired former head of chemistry and chemical engineering dept., University of Washington, and one of the founders of Pacific Coast Tappi section 24 years ago, died last month.

Continued on page 30

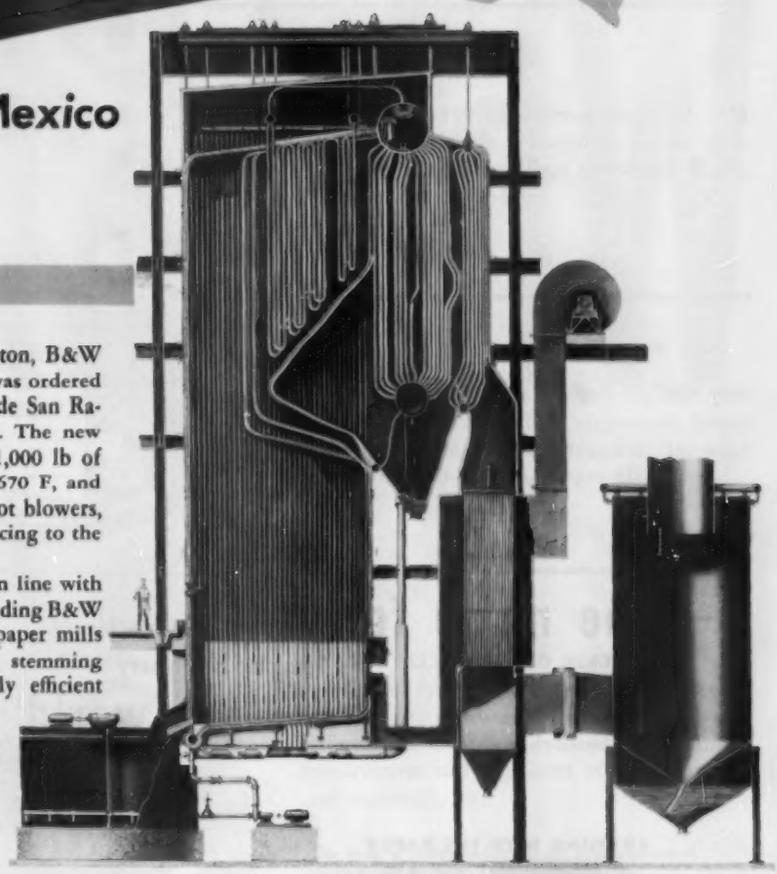


REPUTATION GOES A LONG WAY of B&W Recovery Units

...to Mexico

"South of the border," a 66-ton, B&W Black-Liquor Recovery Unit was ordered recently by Fabrica de Papal de San Rafael y Anexas, S. A., Mexico. The new unit is designed to deliver 31,000 lb of steam per hr at 475 psi and 670 F, and is equipped with automatic-soot blowers, which reduce routine hand-lancing to the minimum.

Destination of this unit is in line with a developing pattern that is sending B&W Recovery Units to pulp and paper mills in all parts of the world . . . stemming from a reputation for highly efficient chemical and heat recovery, with low-cost operation and maintenance, that has been service-proved since 1935.



Typical B&W 2-Drum Recovery Unit equipped with B&W Cyclone Evaporator

BABCOCK & WILCOX
BOILER DIVISION

P-776

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—the name for pulp
paper
paper-making machinery
graphic machinery

the world over

GROWING WITH THE PAPER

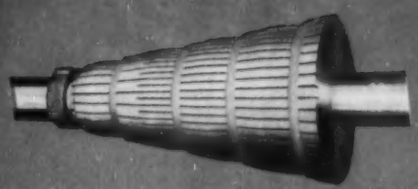
INDUSTRY SINCE 1853

LYDDON & CO.
35 New Bridge St., London EC4, England

PARSONS & WHITTEMORE
250 Park Avenue, New York 17, New York

E.D. Jones

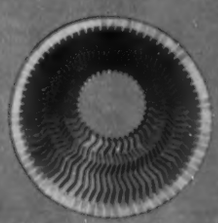
has the answer to your Maintenance and Modernization Problem



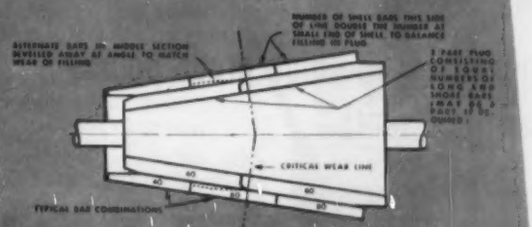
Famous Jones engineering, and over one-hundred years' experience with every type mill and all kinds of paper, are at your service . . . insure satisfaction, whatever your requirements, when you specify JONES maintenance, repair and modernization parts and accessories.

JORDAN PLUGS AND FILLINGS

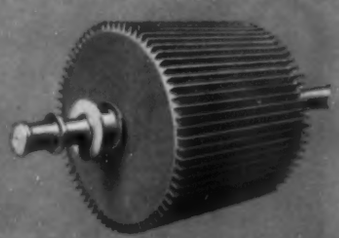
Type P-B PLUG. Dynamically balanced at operating RPM. Easy refilling — no bands to shrink on. Bands mounted permanently in place. Made in sizes to fit any make or size of Jordan.



Greylock Shell Filling. Pre-assembled in a rugged conical assembly. Harrigan design with patented Nowave feature. Bars and woods of any desired standard materials.



Nowave Patented Plug & Shell Fillings provide precise plug and shell alignment, better and more uniform refining, straighter bar wear — no waves or shoulders, longer filling life.



BEATER ROLLS AND BED PLATES

Built in all types and sizes for any make of beater, JONES Beater rolls, bars, woods and bed plates incorporate advanced design, sturdy construction and the finest of workmanship and materials.

On every maintenance or replacement problem, it will pay you to consult your Jones representative *first*.

E.D. Jones

E. D. Jones & Sons Company, Pittsfield, Mass.

BUILDERS OF QUALITY STOCK PREPARATION MACHINERY

In Canada: The Alexander Flock Limited, Ottawa

PULP & PAPER PERSONALS — Continued

PACIFIC COAST NOTES

W. W. MOYER, director of research for Crown Z, Camas, Wash., is currently attending advanced management course at Harvard business school. W. M. **HEARON,** assistant director of research, is in charge until December.

FRANK CASKEY, formerly of CZ Central Research, joined Morden Machines Co., Portland, Ore. in September to head technical phases of this firm as technical manager, according to Pres. **BURKE MORDEN.**

CECIL TAYLOR, recently named production manager of Columbia River Paper Mills and Oregon Pulp & Paper Co., and Mrs. Taylor celebrated their 25th wedding anniversary at their Portland, Ore. home in September.

HUGH BOLGER, Pacific Coast rep. for Cameron Machine Co., has moved from San Mateo, Calif., to 7590 S.W. Fulton Park Bvd., Portland 1, Ore.

GIL OSWALD, formerly production manager of Simpson Logging Co., Shelton, Wash., insulating board plant, has assumed direct charge of both production and sales.

J. A. KRAUTH is new resident engineer for Rayonier, Hoquiam, Wash. He was formerly assistant resident manager for Rayonier at Shelton, Wash. He replaces L. R. Wood, who has moved to Central Engineering Office, also at Hoquiam.

H. E. BURNETT, 44, Camas mill personnel man, died recently from effects of injuries suffered when struck by an automobile over three years ago.

IN NEW SUPPLIERS' POSITIONS

ANTHONY J. CIRRITO (left) promoted to Assistant to the President in connection with advance development and research for the Rice Barton Corp. He is a member of TAPPI and is their Drying and Ventilating Committee.

G. ELMER EMIGH (right) South Gate, Calif., to represent machinery lines of Sandy Hill Iron & Brass Works in Pacific Coast. A. H. Lundberg continues to represent cooking and bleaching equipment. Mr. Emigh was Supt. in mills of I.P., Crown Z, St. Helens, Filer Fiber and Pioneer Flintkote. He lives at 8980 So. Antonio Ave., South Gate.

at **THILMANY**

. . . a well washed pulp is a "must" for the high grade papers produced in this specialty mill!

Very clean pulp with low dilution is essential to low cost of operation at Thilmany Pulp and Paper Co., Kaukauna, Wisconsin. These requirements were *guaranteed* by SWENSON and subsequent operations disclosed better-than-guaranteed performance. Like Thilmany, why not discuss your pulp washing needs with SWENSON.

SWENSON EVAPORATOR CO.
15632 Lathrop Avenue, Harvey, Illinois

SWENSON

Proved Engineering for the Process Industries

SINCE 1889

A Division of WHITING Corporation

Get The Complete Report!
A 6-page paper recently issued gives the full Thilmany story. Write for a copy now!

Worth Checking

DOWNINGTOWN DRYER ROLLS AND DRYER SECTIONS MEAN—

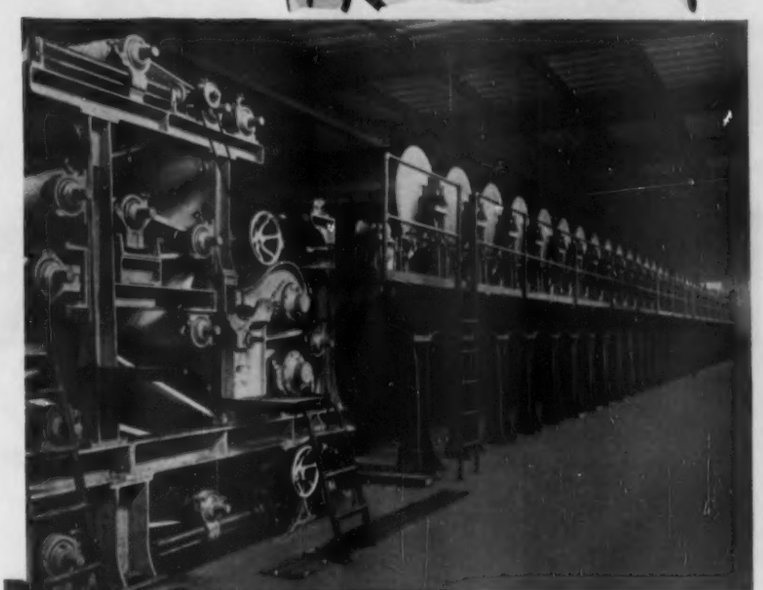
- Uniform heat distribution
- Even sheet tension
- Reduced roll distortion
- Easy access to rolls
- Improved air circulation

Dryer rolls by Downingtown are more uniform, carry heat evenly throughout the roll. And they are concentric and accurately balanced. Using an exclusive Cement Bonded Sand Core Casting technique, Downingtown produces sound, balanced rolls that require less machining, thus reduce metal stresses which may later cause distortion.

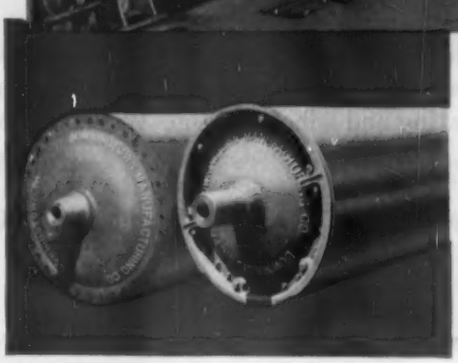
Downingtown dryer stands are engineered to provide sufficient clearance between the mill floor and the lower deck of dryers to permit easy access and improve air circulation.

Downingtown dryers are available in a complete selection of sizes and types for use at steam pressures up to 150 P.S.I. Your Downingtown representative can assist you whether you need a single dryer or a complete installation.

DOWNINGTOWN MANUFACTURING CO.
DOWNINGTOWN, PENNSYLVANIA



Two deck dryer section in a recently installed board mill. (Note Downingtown "Easy Access" framing.)



The Downingtown Dryer Roll at left has recessed studs in the heads. The one at right is provided with a rope carrier.

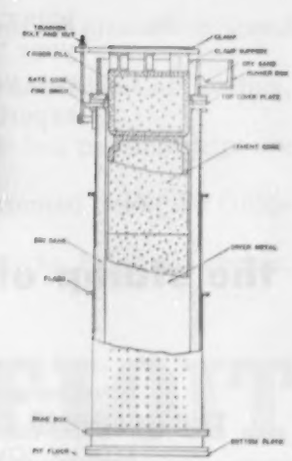


Diagram of Downingtown's Bonded Cement Core Method of molding.

West Coast Representative:
John V. Roslund
244 Pacific Building
Portland 4, Oregon

Export Engineering Department
United States Machinery Co., Inc.
90 Broad Street
New York 4, New York

DOWNINGTOWN
DESIGNERS AND BUILDERS OF PAPER BOARD AND FELT MACHINES SINCE 1880
MODERNIZATION IS PROFITABLE

The superior quality of OK BRAND starches gives you improved tub, beater, and calender sizing. Better for coating and adhesives, too. When you make better paper at no extra cost — you've put more profit in your "paper work". Try OK BRAND and see! Discuss your special starch requirements with Hubinger's expert technicians.

the stamp of quality

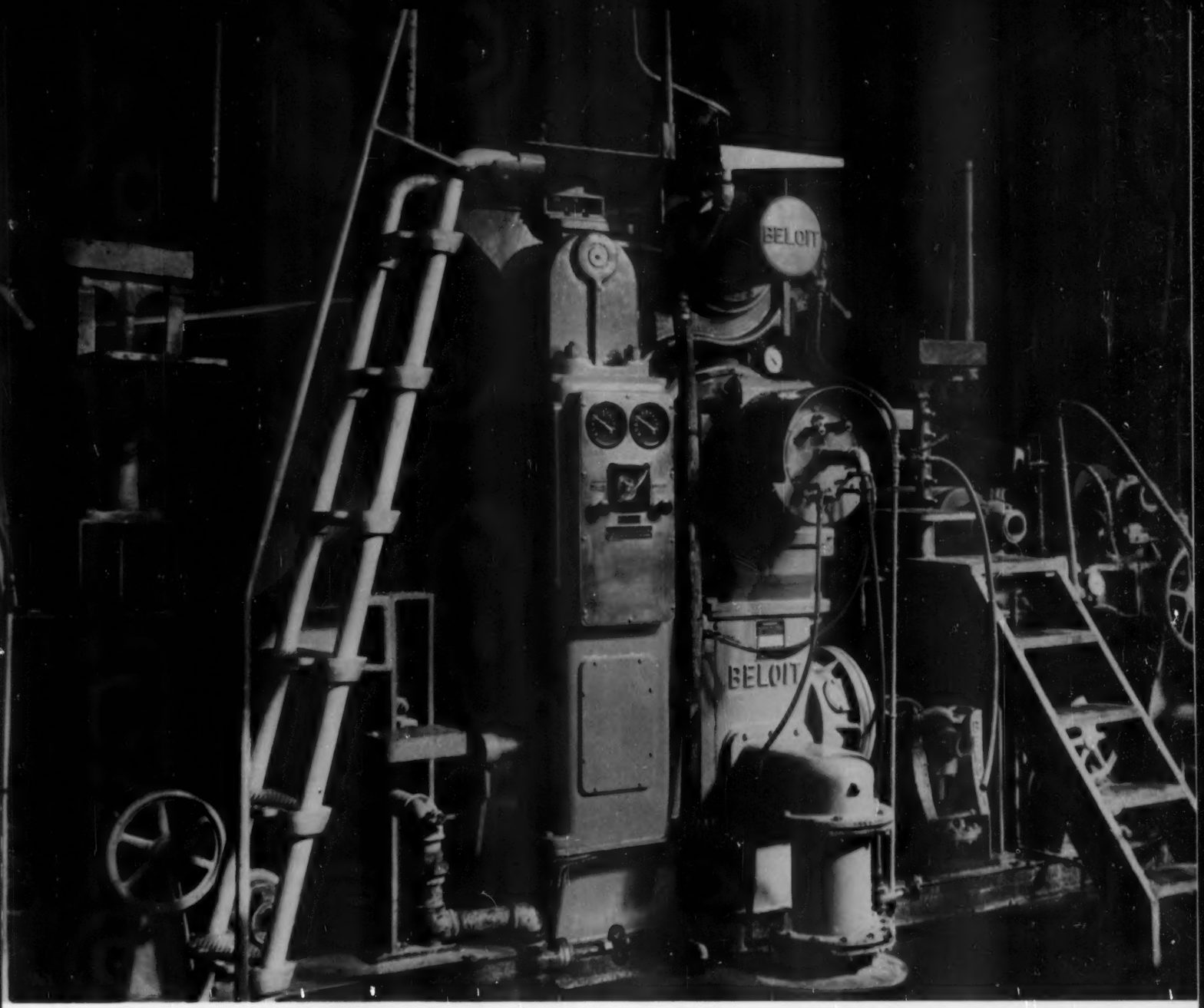
ESTABLISHED IN 1881
THE HUBINGER COMPANY
KEOKUK, IOWA

New York • Chicago • Los Angeles • Boston • Charlotte

OK BRAND

Try these top-quality starches for paper makers:

- OK BRAND Pearl
- OK BRAND E-Type Pearl
- OK BRAND Pearl 700
- OK BRAND Pre-Jel
- OK BRAND Thin Boiling Starch
- OK BRAND Oxidized Starches



Consolidated Water Power & Paper Company, Wisconsin Rapids, Wis.

PRESS REBUILD has substantially increased production speed without further machine changes. This suction second press has resilient air loading, with separate control of pressure at front and back. Suction box packing strips are air loaded for even pressure with minimum friction. Patented Beloit Air Guide for bottom felt is at the right.—*Beloit Iron Works, Beloit, Wisconsin.*

BELOIT

WHEN YOU BUY BELOIT...YOU BUY MORE THAN A MACHINE!

PAPER MACHINERY

Relief... for a production pain

What's your particular "ache"? Looking for ways to cut costs... improve production... speed plant operations... reduce maintenance costs?

Here's a prescription that can provide an effective solution for you... the specialized service offered by your Chain Belt Field Sales Engineer and the outstanding performance of Chain Belt Equipment:

for example: If you want to increase capacity of your wood chip belt conveyors, Rex Wood Chip Idlers are your answer. Because concentrating rolls are sloped at a 45° angle instead of 20°, you can load chips close to the belt edge without spillage... increase conveyor capacity considerably.

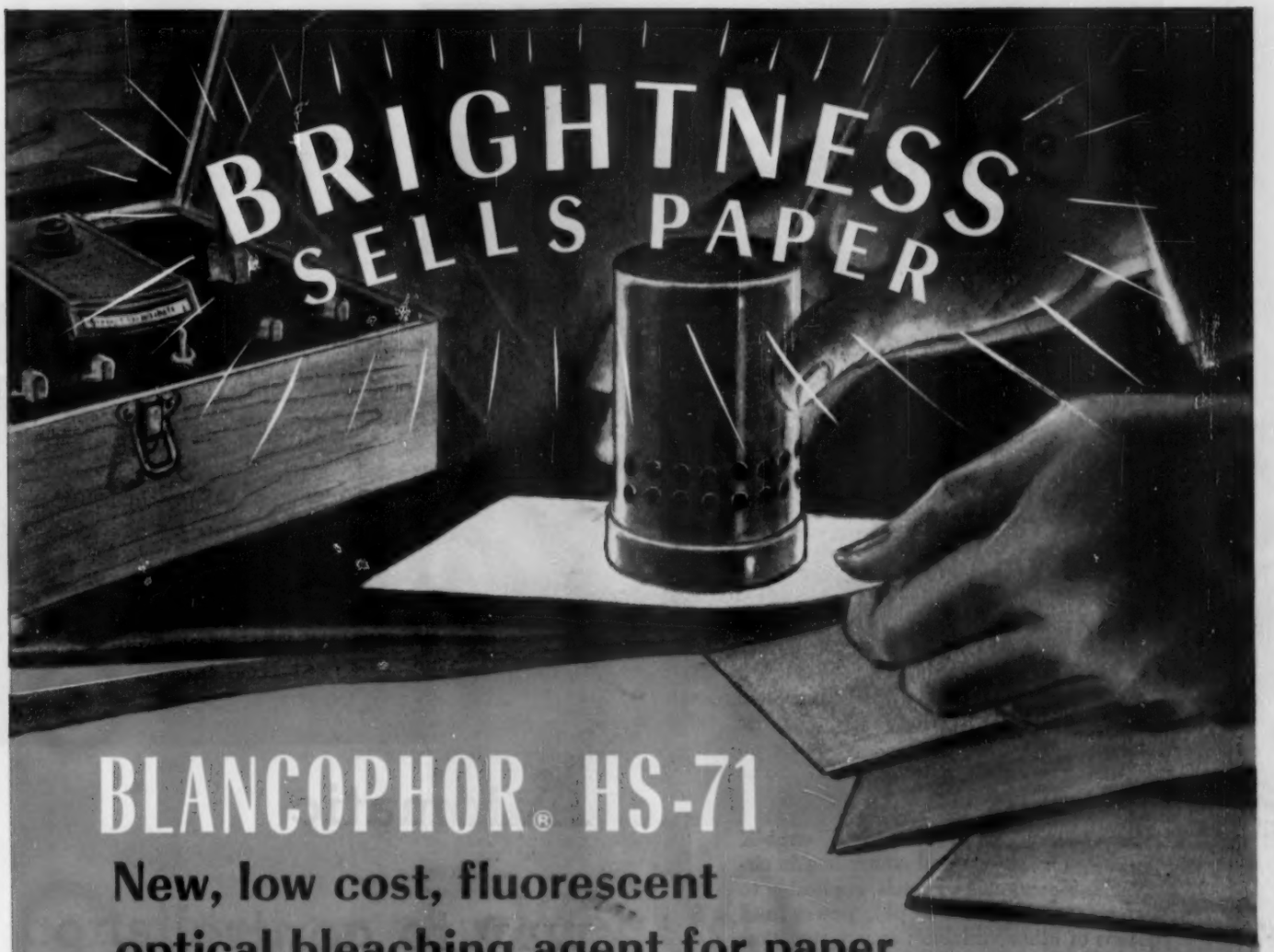
for example: Tried belt transportation for logs? Where conditions are right, belt conveyors can help you increase production... reduce pulpwood handling costs. And, Rex Extra Heavy-duty Flat Belt Idlers are designed especially for this service... to operate efficiently with logs piled high on the conveyor.

for example: If maintenance is your problem, here's a suggestion. Use Rex Split Hardened Rim Traction Wheels and Sprockets. Just install the body, then each rim segment. Replacement of rim section can be done without removing the chain. Down time can be reduced with these long-wearing traction wheels and sprockets.

Whatever your needs... drive chain, conveyor and elevator chain, complete elevators, belt conveyors, feeders, roller bearings, buckets or sprockets, you'll relieve those production pains by looking to Chain Belt. See your local Field Sales Engineer or write direct to Chain Belt Company, 4591 W. Greenfield Ave., Milwaukee 1, Wis.

CHAIN BELT COMPANY

District Sales Offices and Distributors in all Principal Cities



BLANCOPHOR® HS-71

New, low cost, fluorescent optical bleaching agent for paper

The new BLANCOPHOR HS-71 which shows exceptional solubility in water is recommended to improve visual brightness of white papers by coloring in the pulp, on the surface or in coating applications.

When applied to paper, BLANCOPHOR HS-71 yields brighter whites without the pinkish cast of the usual paper brighteners.

Papers colored with BLANCOPHOR HS-71 show excellent resistance to attack by acidic atmospheric gases by retaining their brightness.

Write today for information on BLANCOPHOR HS-71.

From Research to Reality

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A SALES DIVISION OF GENERAL ANILINE & FILM CORPORATION

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Portland, Oregon · San Francisco · IN CANADA: Chemical Developments of Canada, Limited, Montreal

From one source . . . any instrumentation you need

When it comes to measurement and control, every industrial process is different. Each demands its own combination of accuracy, economy, instrument ranges, and all the numerous other characteristics that are peculiar to the individual application.

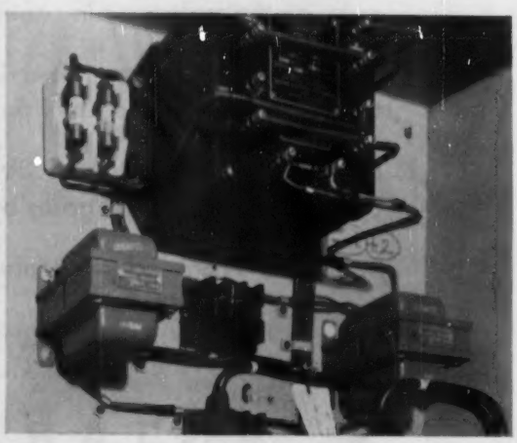
No single instrument and its accessories could possibly fit every process. So Honeywell makes a broad variety of measuring and controlling equipment that spreads across a tremendous range of applications.

The advantages are two-fold. First, you can get all the instrumentation your process requires from a single source, so there is undivided responsibility for the complete installation. And second, you are assured that the equipment selected for your process is recommended without bias . . . neither over-sells nor under-equips . . . needs no stretching, squeezing or compromising to fit it to its assignment.

This versatile family includes *ElectroniK* indicators, recorders and controllers in circular and strip chart models, applicable to temperature, pressure, pH, power and dozens of other variables; square root flow meters for control applications; evenly graduated flow meters for cost accounting; thermometers, pressure gauges and liquid level meters; *Pyr-O-Vane* millivoltmeter controllers. Especially useful for graphic panels are the *Tel-O-Set* miniature indicators, recorders and controllers. Electric and pneumatic control systems range from the simplest to the most complex, including automatic program controls and complete systems developed for particular processes.

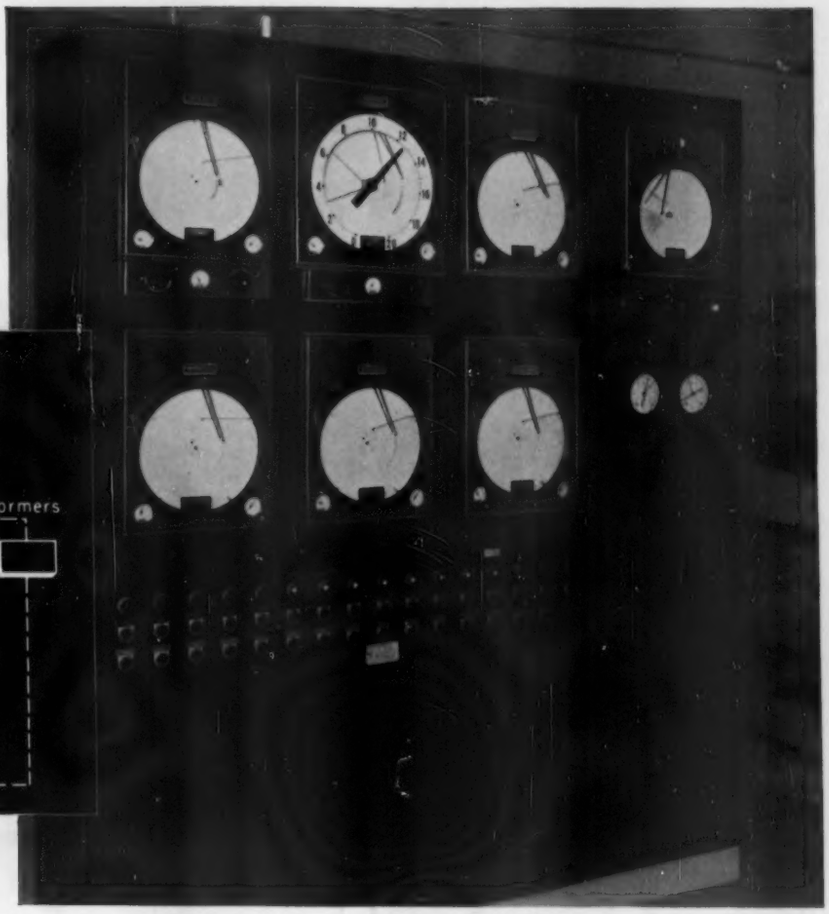
Working with these instruments is a full choice of primary elements . . . thermocouples, *Radiamatic* radiation elements, pressure-type and electrical resistance thermal systems, flow meter bodies, pH cells and many others. For final control elements, you can choose from a wide range of electric motorized and diaphragm operated valves. To complete the picture, there are more than 7000 non-indicating devices for controlling temperature, pressure, vacuum, liquid level and humidity . . . an unmatched variety of instrumentation made by the world's largest manufacturer of control equipment.

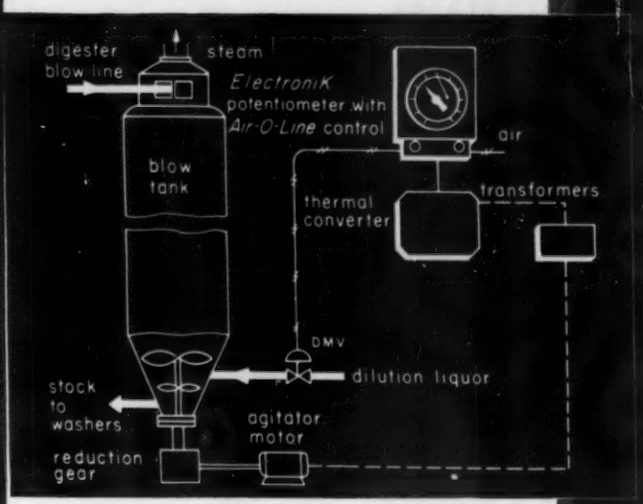
Automatic way to control



Agitator motor load is detected by thermal converters, connected through transformers to the motor input circuit. Similar instrumentation is also being applied to consistency measurement in high density stock storage tanks and bleach towers.

Complete Brown instrumentation on this blow tank control panel includes (in upper row) ***ElectroniK*** *Stock Consistency Controller. Diagram shows basic elements of the consistency control system.*





consistency of paper stock

BY APPLYING *ElectroniK* instrumentation to automatic measurement and control of stock consistency, paper makers are adding an important link in the chain of modern process instrumentation. When used as part of the blow tank control, this equipment continuously measures and records the consistency of the stock in the tank. And by regulating the flow of black liquor for dilution, it automatically maintains consistency at optimum values.

The instrument measures stock consistency in terms of the electrical power required to drive the agitator motor. When consistency rises, the motor draws more power . . . and vice versa. By using a thermal converter in conjunction with suitable current and voltage transformers, motor power input is changed to a d-c millivoltage signal that the *ElectroniK* instrument can readily measure.

The *ElectroniK* instrument responds quickly and accurately to changes in consistency. By controlling automatically, it releases operators for other responsibilities . . . helps to eliminate fluctuations in stock flow to washers . . . protects production against failures of agitator motors, or washer pumps.

ElectroniK control of stock consistency is designed as an integral part of Honeywell control for modern paper processing. Your nearby Honeywell sales engineer will be glad to discuss your specific application . . . and he's as near as your phone.

MINNEAPOLIS-HONEYWELL REGULATOR CO., *Industrial Division*, Wayne and Windrim Avenues, Philadelphia 44, Pa.

● **REFERENCE DATA:** Write for Data Sheet No. 29.0-4, "Consistency Control for Paper Mills."

MINNEAPOLIS **Honeywell**

BROWN INSTRUMENTS

First in Controls

Shovel-loading train of gondolas.

Crude Sulphur

for Industrial Use

from the properties of

Texas Gulf Sulphur Co.

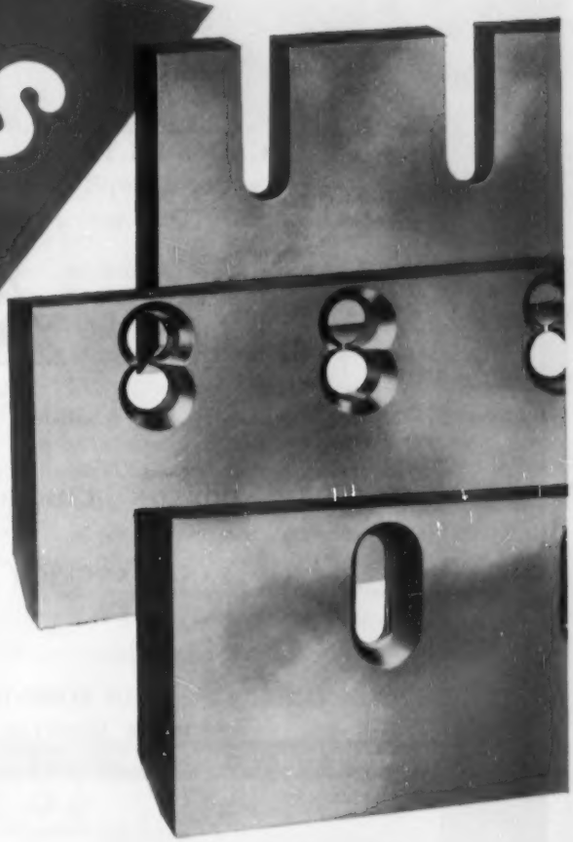
75 East 45th Street • New York 17, N. Y.

Producing Units

- **NEWGULF, TEXAS**
- **MOSS BLUFF, TEXAS**
- **SPINDLETOP, TEXAS**
- **WORLAND, WYOMING**

Get the DUST OUT of your PROFITS

...with SIMONDS T-18 CHIPPER KNIVES



More usable chips . . . clean-cut and uniform in size . . . with a minimum of slivers and dust . . . this is what you *want* from your woodroom . . . this is what you *get* with SIMONDS T-18 KNIVES on your chippers! Made of extra tough steel developed and poured in Simonds own Steel Mill, these rugged, shock and abrasion resistant knives are known for their ability to take the high speed, brutal beating of chipper operation . . . to hold a keen cutting edge . . . to turn out clean-cut, uniform chips. Try T-18 Knives on *your* chippers . . . get the dust out of *your* profits. Order through your Industrial Distributor.

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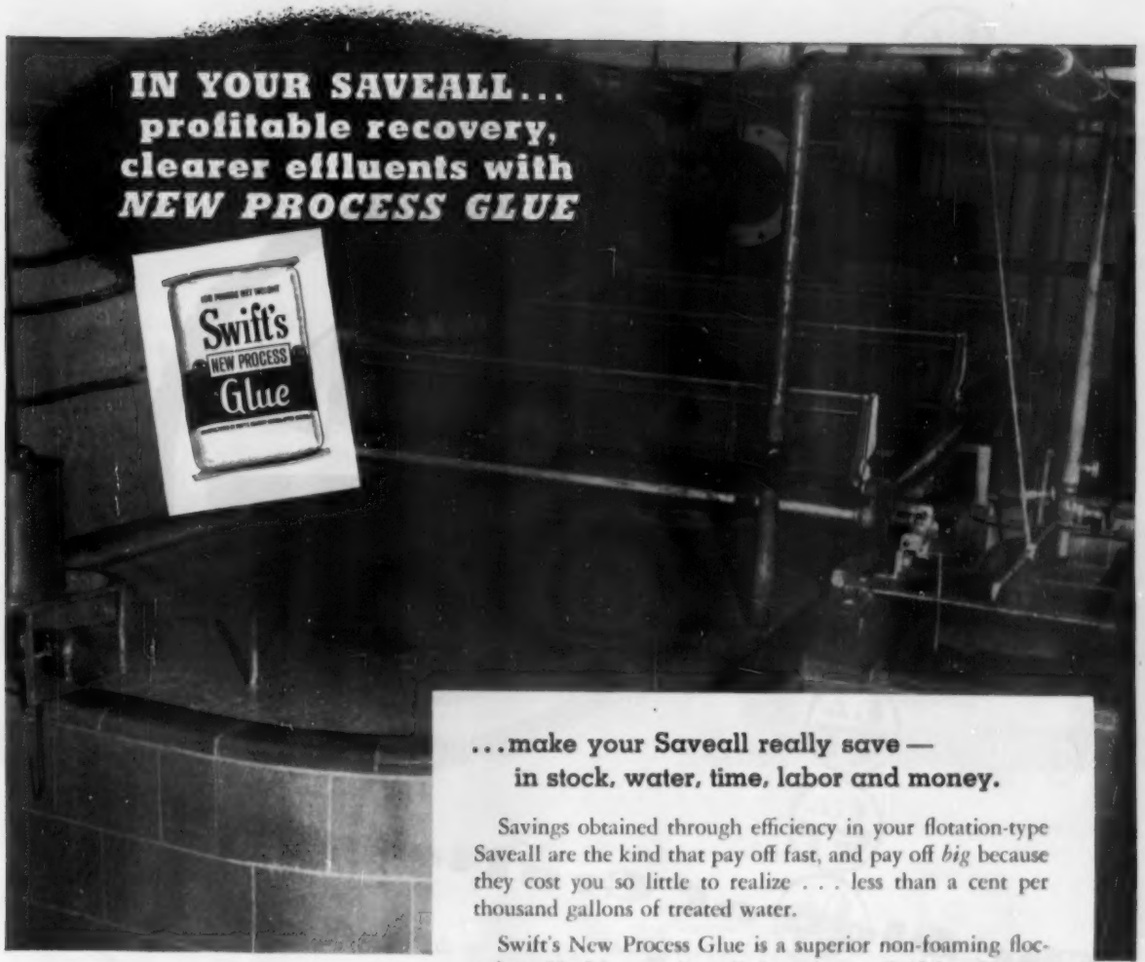

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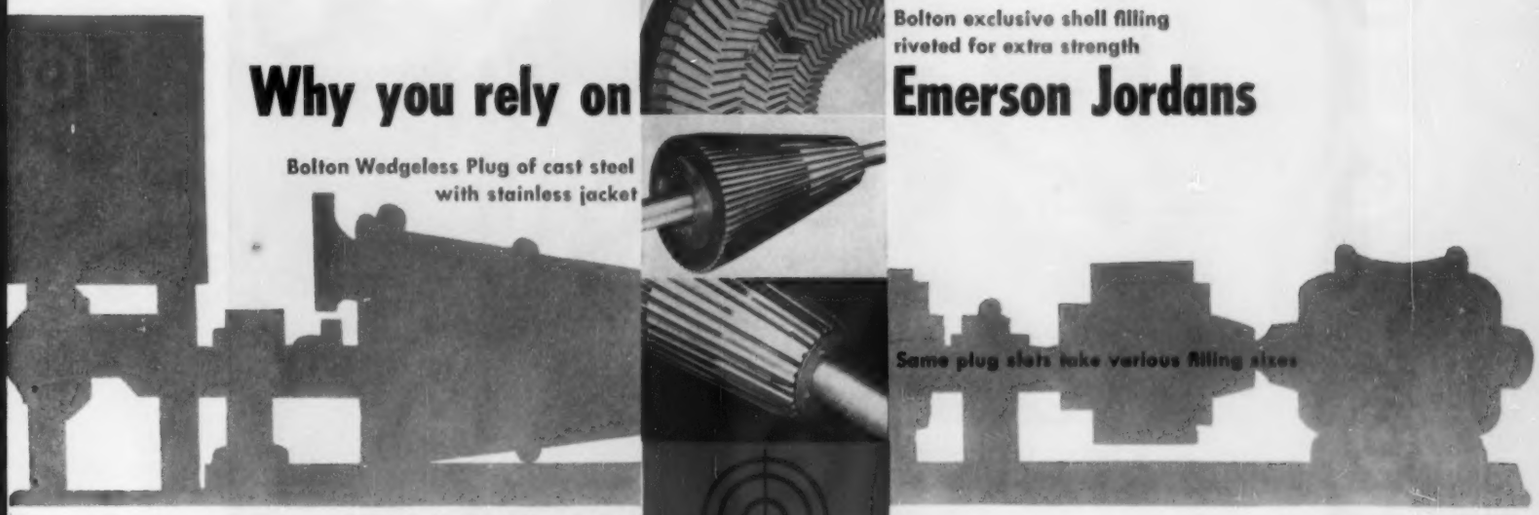

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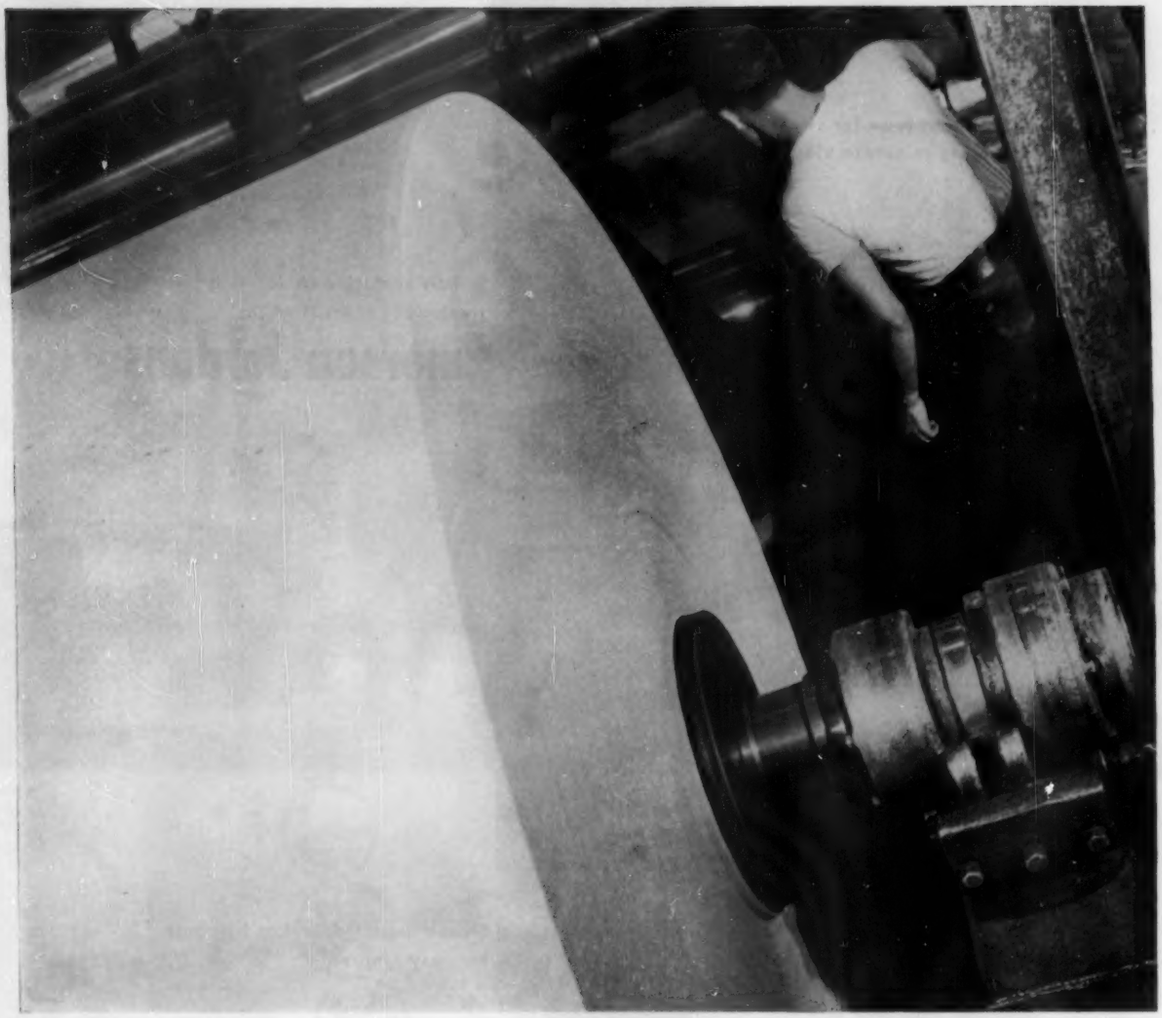

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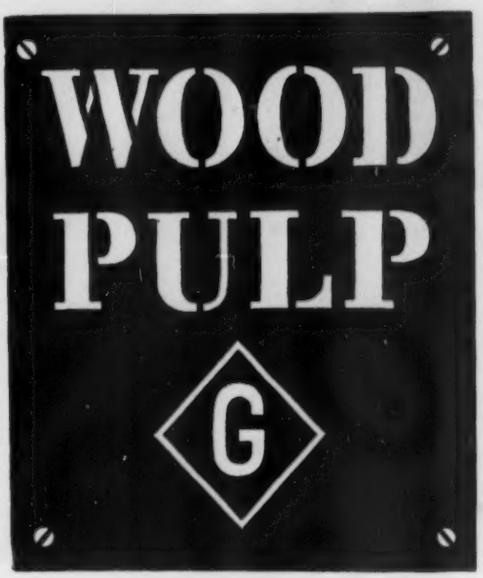

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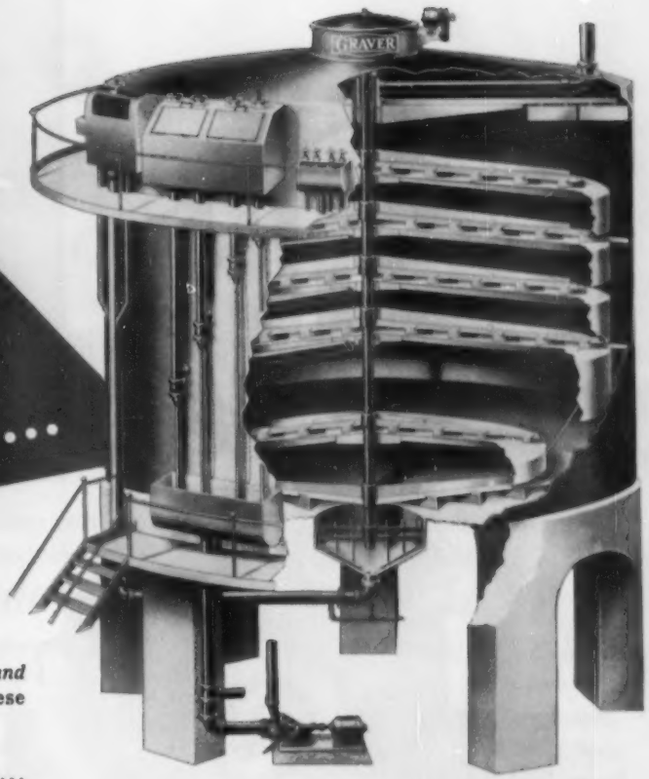

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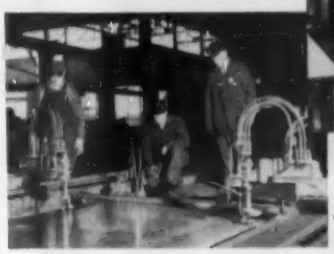

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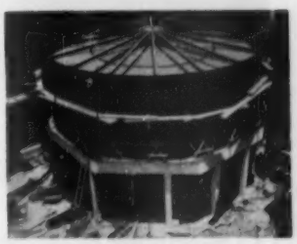

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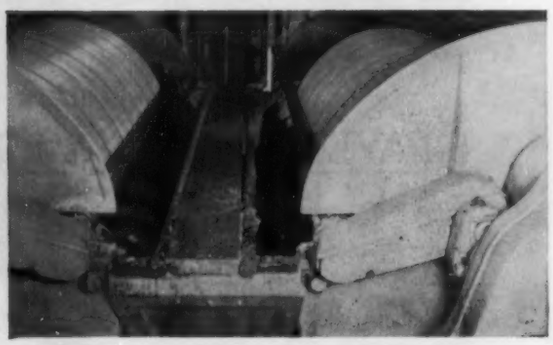

And in this service to your industry, going back to the early twenties, you can find several pioneering steps on the part of Oliver United engineers, each step leading to improved operations and lower pulp handling costs.

PULP and PAPER MILL EQUIPMENT

Take, for example, the Oliver Washers and Deckers, developed by Oliver United engineers. These units have shown conclusively that they give superior service.

OLIVER-AMERICAN DISC TYPE SAVEALL

Another important development for the paper manufacturers is the adaption of the Oliver American Disc Type Saveall. Its place in the mill picture is in handling certain types of slow stocks; or with high speed machines or with very large machines where extra large volume of water is being handled. This filter requires much less floor space than the drum type saveall for any given filter area.

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Details relating to any of the many Hydrapulper applications upon request. Several types. Full range of sizes.

Slushing of old papers—continuous . . . Slushing of virgin pulps—batch or continuous . . . Reslushing of broke. Manual or automatic control . . . Fast, thorough blending . . . Fast, thorough color and chemical mixing . . . Basic unit of the modern de-inking system.

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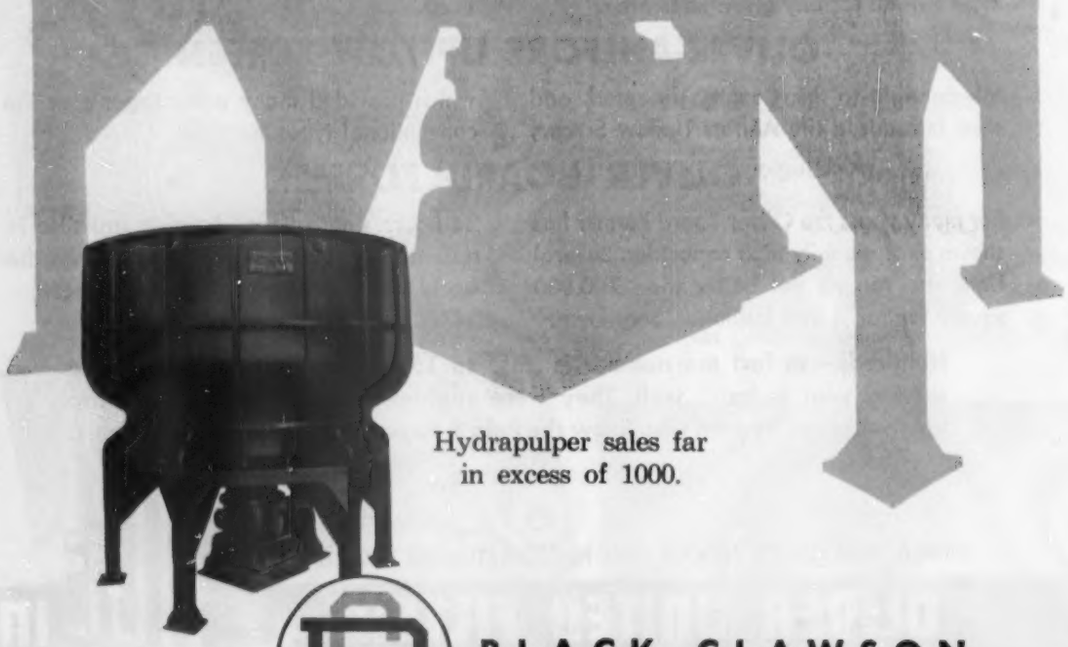

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PULP & PAPER

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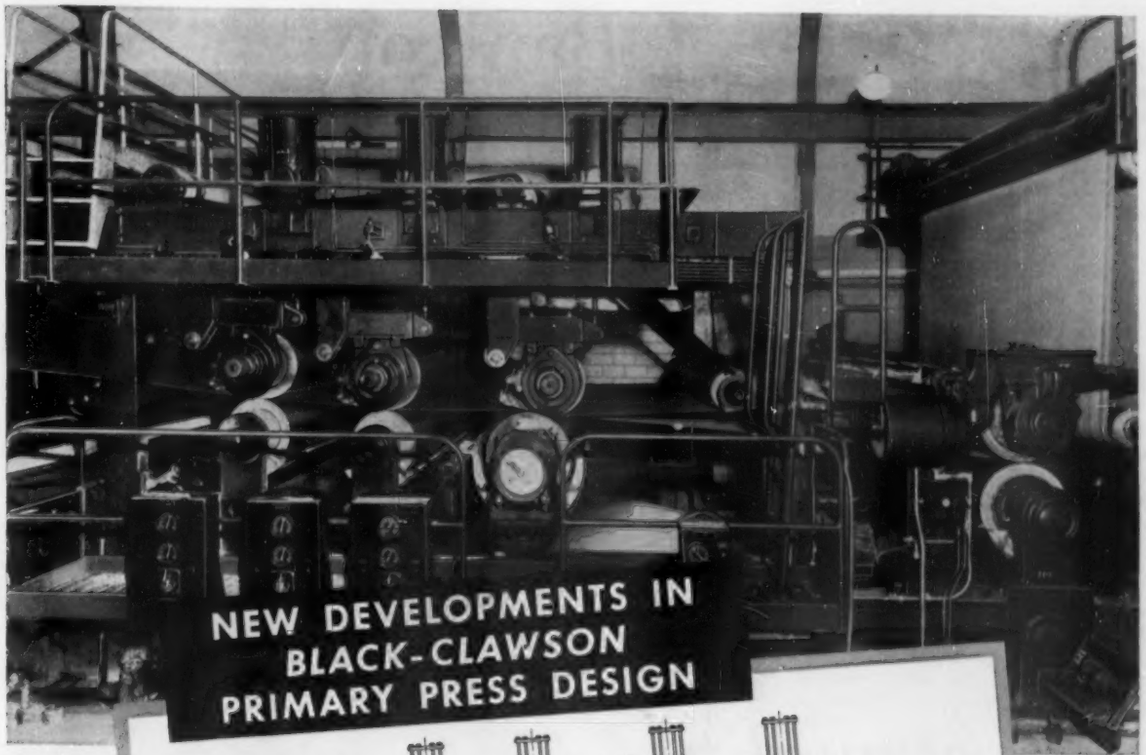

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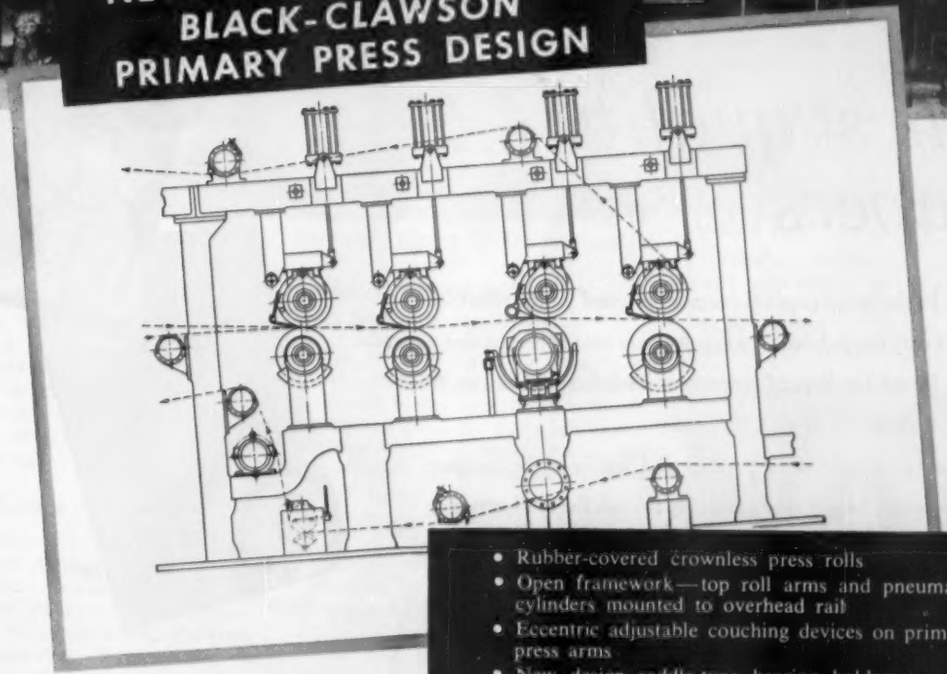

- Rubber-covered crownless press rolls
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- Eccentric adjustable couching devices on primary press arms
- New design saddle-type bearing holders on top primary press arms eliminate bolt removal for quick and easy felt changes
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Primary Press Section shown here installed on new B-C machine at Manchester Board & Paper Co., Richmond, Va.

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PULP & PAPER

WHAT'S GOING ON IN THE MARKET PULP WORLD

British Mills, Buyers Of Pulp, May Make Own

Important news from England is that two of its major groups of paper mills are jointly looking for ways and means of making pulp for themselves, to some extent, from little used hardwoods, "weed" trees of the British Isles. This is real news as all their pulp has been purchased heretofore. The companies are Albert E. Reed & Co., whose mills have long bought woodpulp and do not even buy esparto grass, as some British mills do, and also the Wiggins Teape Group of 14 specialty paper mills.

Three Reed representatives, Chemical Engineer Joe Chapman, Fred Amies, their London mills chief papermaker, and Andrew Forbes, assistant chief engineer of the Aylesford mills, were touring mills from Camas, Wash., to Savannah, Ga., as this was written. Wiggins Teape's chief researcher, Dr. Herbert F. Rance, and Robert Gladstone, their production manager, also made a coast-to-coast tour.

The development of semi-chemical pulping of hardwoods in the United States and Canada has advanced greatly over recent years and will probably be studied by Reed and Wiggins Teape men if they go ahead with their plan to use the neglected wood in Britain.

Studies Europe Market

Woodpulp sales possibilities in Europe were studied by W. E. (Pat) Burns, sales manager of Canadian Forest Products, Ltd., New Westminster, B.C., on a recent trip. His company is planning on expanding its market pulp production with a new mill on Vancouver Island.

T. Lloyd Roberts, sales manager for Alaska Pine & Cellulose, Vancouver, B.C., toured not only Europe, but India, Japan and the Far East to survey pulp markets.

Italy Imports Czech Wood

Under a barter deal with Czechoslovakia, Italy will import cut firwood for pulp production to the value of 35 million lire. The deal has been approved by the Italian Ministry of Foreign Trade.

Swedish Exports Increase

Sweden's exports of woodpulp increased in the first half of this year over those of the similar period of 1953. They also were increasing as this year grew older.

For the 6 months period, pulp shipments were up 17%. Paper and board exports were up 18%. These took up much slack caused by declines of 10 to 15% in exports of timber, iron ore, iron and steel.

Puget's Sales Up

Puget Sound Pulp and Timber Co. derived a net income of $1,600,479, equal to $2.06 a share, from operations in the first six months of 1954, in comparison with $1,448,243, or $1.86 a share, in the corresponding period of 1953. Net sales and other income for six-month periods rose to $10,833,370 from $10,205,532 last year. Pulp production at Bellingham totaled 77,467 tons in the first half of this year, against 70,392 last year.

Cellulose Group Builds 100,000-KW Power Plant

The Swedish Cellulose Co., is to build a 100,000-kw power station at Balforsen in the Ume River in North Sweden. Two of the three aggregates with an output of 70,000 kw are expected to be put into operation at the end of 1958.

A special company, Balforsens Kraft AB, has been formed for handling the Cellulose Groups power interests by reorganizing the affiliated Ostrands AB. It has a share capital of Kr. 25,000,000 ($5,000,000). Harnessed and exploitable water-power resources now under the control of the new company represent a total annual output of about 2,000,000,000 kWh.

New Outlet for Pulp Named

Olin is the name selected for the town site of the new cellophane plant to be constructed in Indiana by the Olin Mathieson Chemical Corp. The plant will be known as The Olin Works.

The site, formerly known as Kerm, is about 10 miles east of Danville, Ill., on the Wabash River.

Canadian Pulp Sales Are Increasing

Canada continues to show important gains in her export of market pulp.

Figures recently released show that for the first seven months of 1954 the total tonnage exported was up 11.6% over last year. All important chemical grades with the exception of unbleached sulfite showed market increases. Bleached sulfite rose to 411,092 against 348,627 a year earlier. Bleached kraft rose to 365,255 against 306,022, and unbleached kraft rose to 109,333 against 92,921 for 1954. Unbleached sulfite dropped to 190,357, a decrease of some 8,000 tons.

Shipments increased as the year progressed, so that an even higher percentage of increase is looked for for the balance of this year.

Added Kraft Capacity

Svenska Cellulosa's Munksund Kraft pulp mill is to increase its capacity by another 20,000 tons a year —from 50,000 to 70,000. The expansion will cost $300,000,000.

A VETERAN TRAINS A ROOKIE FOR JOB TOURING ALL AMERICA

OLE M. HALSE (left), Service Engineer for 22 years to North and South American paper mills for Swedish Cellulose Co., now travels over his vast territory with CLAES G. HALL (right), eventually heir to Mr. Halse's position. Young Hall graduated from Stockholm Royal Institute last year. He is 24-year old son of Coesta Hall, well known in America as former Swedish Cellulose sales executive, now Sales Mgr. of Korsnaes Co., making rayon, kraft and sulfite market pulps at Gaevle, Sweden. Mr. Halse, 66 years old, was born in Norway, moved to Sweden 23 years ago.

I.P. MAN IN ACTION

Leading seven International Paper men to Birmingham Pulping meeting was I.P.'s top technical man TONY PESCH. At left, discussing high yield, are (l to r) DAVID WETHERHORN, Robert Gair Co., GEO. WHITESIDE, Container Corp. of Amer., Fernandina, and Mr. Pesch. At right, Mr. Pesch again, in a discussion on hot stock washing with PETER BORLEW (left), National Container, and LIONEL SUTHERLAND (middle), Sutherland Refiner.

What the South Has Done to Improve

Its pulping processes is revealed at Birmingham meeting; high yield and semi-chemical panels enliven session

• "No matter how much a technical man knows, unless he is understood by others and can express himself in non-technical language, he is of little value to his company and will not be able to accomplish the goals for which he is striving."

This was the message of Jack W. Warner, a veteran officer of Merrill's Marauders in the Burma War Theater and now executive vice president of Gulf States Paper Corp., at the 8th annual Alkaline Pulping Conference which drew about 250 industry men to Birmingham, Ala., Oct. 6-8, from as far away as New England and the Columbia River, northern Minnesota and Wisconsin. There were not just kraft men—for a semi-chemical pulping panel drew from companies using the neutral sulfite process, too.

There were not only technical men, but a goodly number of top management, too, including such men as Exec. Vice Pres. Tom Price of Hammermill, Vice Pres. C. S. Huestis of Robt. Gair, U. J. Westbrook, new manager of all pulp mills for St. Regis, Vice Pres. Tom Coldeway of St. Joe, Mill Manager George L. Clarke of Coosa River, Dave Kube and C. W. Smith, managers of development and production, respectively, at Crossett.

Of nearly 250 who attended, close to 110 were mill men.

Mr. Warner, whose mill and Coosa River Newsprint were co-hosts, stressed the point that "the new industrial leader today must know generally what is going on in the world and how these things affect his company."

Recalling his grandfather founded what is regarded as the first kraft mill in the South in 1912, Mr. Warner reviewed industry progress and said it still "needs better utilization of the tree."

He came back to his theme that a technical man must learn to tell others "what is in his mind—all members of our industrial team must understand each other if we are to succeed."

MAIN SPEAKER

JACK W. WARNER, Exec. Vice Pres. of Gulf States Paper Corp.

I.P. TAKES BIG PART—Notable development at Birmingham was that A. W. (Tony) Pesch, top technical authority for the nine International Paper mills in the South, became a member of the Tappi alkaline pulping committee, headed by Malcolm Pineo, Brunswick's technical director, and Mr. Pesch led a solid phalanx of eight I.P. technicians to the meeting, disclosing the apparent intention of that company to reverse its historic nonparticipating position in order to take active part in the exchange of industry technical information. Mr. Pesch himself was a leader from the floor in a lively discussion of hot stock refining and high yield pulping washing.

Incidentally, this discussion touched on what is becoming one of the serious problems of this industry—how far competition is going to drive mills to upgrading qualities of disposable products such as food containers with high grade bleaching, coatings, etc. The brown color of products in Southern mills was discussed not only in the meeting, but in several rooms afterwards. One mill executive said: "It is a problem for our salesmen to establish the color is good background for printing, not a problem for us to keep increasing production costs to take it out."

Others asked: "We are adding to expense of throw-away items every time a competitor comes along with some up-grading idea, forcing all others to follow suit. It is time for statesmanship within our industry to set some limits on how far we must go. After all, how much does the consumer really care?"

These were practical post-meeting discussions affecting costs, more provocative than even the discussions heard in the meeting.

Geo. M. Rust, president of Rust Engineering, was responsible for excellent local arrangements in the conduct of this meeting. H. Y. ("Charb") Charbonnier, a 14-year veteran with Union Bag where he is now assistant manager of the pulp and paper division, arranged the program.

Arthur Wakeman, president of Coosa River Newsprint Co., George L. Clarke, mill manager, who left International Paper back in '46 to help Kimberly-Clark build its first kraft mill in Ontario, Phil Bachelder, secretary, and the entire Coosa staff showed their spick-and-span mill, a model of good housekeeping and modern newsprint and kraft-groundwood operation, in a tour followed by

a barbecue at Coosa Pines. A smaller group toured the Gulf States mill.

Robert Fuller, with Gulf States 20 years, almost since graduating from Alabama, and now its technical director, had a multitude of duties as committee secretary in putting on the Birmingham meeting, and was chief host for his mill.

WHAT UNION BAG AND CROSSETT DO—A Union Bag trio prepared a report made by R. E. Millar which told of changes at Savannah in the processing of knotter rejects. Presently they are being cooked separately and he said Union is getting better mill control and better end products as a result of doing this. They are re-cooked in a conventional digester.

Research director K. G. Chesley and a Crossett colleague, P. L. Gilmont, told how that mill found there was not much difference in end products as a result of limited changes in sulfidity. Crossett dropped sulfur use from 26% to 17% in kraft cooking and there was no loss in quality. Not as much elemental sulfur has to be added to salt cake for cooking as previously.

At Brunswick Pulp & Paper, a change was made from indirect steaming to direct steaming of unbleached hardwoods with a resulting increase in yield from 44.10% in 1952 to 45.20% in 1954. And soda loss in wash room for this period was reduced from 35.2 to 31.8 tons per ton of pulp. Percent of solids in black liquor to evaporators remained about 15.7%. By indirect steaming of hardwoods, 70 cents to $1 per ton of pulp was saved, according to Owen Hunter and Hansel Wade. It was a different story in direct steaming of pine, unleached, and this so far has not been as satisfactory. A Mullen loss from 139 to 127 in a two-day plant trial was reported, but Brunswick intends to continue experiments with pine.

ABOUT THE ODOR PROBLEM—T. T. (Tex) Collins, Jr., National Container, Jacksonville, Fla., tech. director and formerly with Thilmany, reviewed some results of full scale black liquor oxidation in U. S., Canada and Sweden. For example, the Port Alberni, B. C., plant has demonstrated that an oxidation system is capable of reducing odors released by digesters. The uncertainty of results and difficulties in measuring results are ever-plaguing sidelights on this problem, as he indicated in admitting that where 90% of an odor is reported abated, it may still smell the same near the mill as before, but the smell does not extend as far away.

One pilot plant used asbestos-cement sheets with a diamond surface pattern imposed on them for filling an oxidation tower.

A mill at Porsgrunn, Norway, reports 98% oxidation. Reduction of odor of evaporator condensate here makes it possible to use this wash water in the causticizing plant when a conductivity alarm warns of boil-overs. Lime saving of 60 lbs. per ton of pulp is reported.

A new larger black liquor venturi scrubber on 250 ton furnace at Thilmany Pulp & Paper and a smaller unit at the Bare mill, Roaring Springs, Pa., are economically and technically successful, he said.

Mr. Collins, who has developed what he described as a technically successful and economically justified oxidation system, said that mill sulfidity level can be kept higher with a combination of oxidation and a venturi scrubber. A scrubber solves two-thirds of the problem, he said, adding some minor changes usually should be made in recovery boilers.

Benefits of oxidation are better evaporator operations and maintenance, better furnace operation, less hydrogen sulfide loss, lime and sulfur savings and various cooking advantages. The only disadvantage is a probable increase in corrosion of green and white liquor systems due to higher sulfidity.

He cited two Swedish reports of lime savings of 14.2 and 60 lbs. per ton of pulp. A report for Howard Smith Mills of Canada showed sulfidity raised from 27-31% to 35-38% and one

DISCUSSIONS WERE LIVELY AT PULPING MEETING

(Top row, left) High yield and brown stock washing were common interests for this panel (l to r) DAVID WETHERHORN, Robert Gair, WM. B. SIMMONS, St. Joe Paper Co., JAME LIMERICK, Bathurst Power & Paper, LIONEL SUTHERLAND, Sutherland Refiner Co., and GEO. H. WHITESIDE, Container Corp. of Amer. (Right) The man who handled arrangements and registrations—ROBERT R. FULLER, a 20-year-man with Gulf States Paper.

(Second row, left) H. Y. (Charb) CHARBONNIER, Union Bag & Paper Corp., a leader in kraft pulping conference. (Right, l to r) W. W. MATHENY, National Container of Wisconsin, TEX COLLINS, National Container, Florida, who gave papers; K. G. CHESLEY, Crossett Co., another conference leader.

(Bottom row, left) Two friendly competitors with important roles in conference— C. W. CONVERSE (left), Sprout, Waldron, and LEE EBERHARDT, Bauer Bros. (right). Talking kraft pulping are TOM S. COLDEWAY (left), St. Joe Paper, and WILBUR F. GILLESPIE, Gaylord Container.

COOSA RIVER SCENES

(Top) R. P. (Tom) PRICE (left), Vice Pres. and Gen. Supt., Hammermill Paper Co., is greeted at Coosa River Newsprint Co. by its Pres., ART WAKEMAN.
(Second) GEO. S. CLARKE (left), Mill Mgr., and PHILIP A. BACHELDER, Secy. and Asst. Treas., Coosa River, greeting visitors at their mill.
(Third) Helping to make visitors welcome at Coosa River (l to r), JOHN T. THURNER, Woodyard Supt., Miss SKEETER MITCHELL, Payroll Dept., and ERNIE MANDERS, Technical Supt.
(Bottom) The boss at Coosa River also gets some service—Miss BETTIE HARRIS, Personnel Dept., serves Pres. ARTHUR WAKEMAN.

for a Weyerhaeuser oxidation set-up showed sulfidity raised from 16 to 20% and makeup of 18 lbs. of sulfur per ton of pulp also was eliminated with oxidation in this case.

Mr. Collins presented off-the-record costs for an oxidation system in a 600 ton kraft mill in the South, but they were controversial.

DIGESTER TEMPERATURES VARY—Taking of top digester temperatures and pressures is an inadequate check on performance during the cook, according to John Morris, Armstrong College, Savannah, Ga., formerly with Union Bag & Paper Corp., who demonstrated through slide-reproduced charts with instrument checking at mid-section and bottom that abnormal conditions may be in existence. Slides show cases where temperature in the bottom of the digester fell below readings from the top in a substantial manner. The thermometer just inside the digester shows warmest at the top, next warmest midway down and coldest at the bottom. Where four jets are used to introduce liquor at the bottom the lining showed light colored and slick down to just below the midway mark, then a 3-ft. band of black, and below that an appearance of rusty iron was noted. This was caused by turbulence that disturbed normal circulation. He said one central jet is best.

Successful use of automatic digester control came on a third trial installation at North Carolina Pulp Co., said Joseph F. Keyes. When instrument company engineers made the automatic pressure and temperature controls work, the mill purchased ten more sets. The automatic control saves 300 to 500 lbs. of steam per ton and has less liquor loss from foaming. After the first 20 min. of warming up the cook, the mill eases off on the steam to permit entrapped air to escape.

HIGH YIELD PULPING—A high yield pulping panel included G. H. Whiteside, Container Corp. of Amer.; L. M. Sutherland, Sutherland Refiner Corp.; William B. Simmons, St. Joe Paper Co.; David Weatherhorn, Southern Paper Corp.; and J. McK. Limerick, Bathurst Power & Paper Co., moderator.

Uniformity is the important factor in cooking, said Mr. Whiteside, starting with chips not quite ½ in. size. Bring the temperature up slowly; do not stint on chemicals or you'll have evaporator trouble; check digester temperature and pressure at three points.

On refining, Mr. Sutherland recalled that as the chlorine goes up, the reject percentage does also, reaching a non-commercial basis. He said the hydration control figure must be selected.

Brief recital of tests made on a number of variables to determine the most useful as a quick yardstick was given by Mr. Simmons and from his talk there followed general floor discussion. In two pulp mill experiences used for background, the Sutherland refiners are used in one and Claflin units in the other.

KNOTS BEING USED—Utilization of knots does not adversely affect pulp quality, either bleached or unbleached, and their addition after being hammermilled serves to increase mill yield, declared Albert L. Wiley, Riegel Carolina Corp., Acme, N.C. The mill is adding a Morden Stock-Maker because of increase in capacity. Bleaching of knot fibers separately would create difficulty, he said. Technique used is to prevent fiber bundles, and keep down shives. The chlorine dioxide bleach will pass specks. Riegel prefers to handle knots mechanically in straight line rather than recook.

High-density control level can be effected automatically and an even removal be maintained, said A. P. Yundt, Camp Mfg. Co., Franklin, Va., who said bubble tubes are reliable in bleaching kraft if not inserted straight but turned downward. Maintenance is essential, a water purge being used to clear the tube. Chlorine must be added on the rising stage, and with not all black liquor out the permanganate number is not a true one but a bleach demand number. Conventional sampling gives an hour old answer, but Camp takes a 3 gram sample when stock comes from the hypo mixer. It is boiled 10 min., dried and made into brightness sheet that shows what will come out five hours later.

Bamboo kraft pulp properties lie between Southern pine and Southern gum, the most favorable process being a modified kraft (Raitt) in which soluble substances are removed in two stages according to their different degrees of solubility. Yields fall in line with Southern pulp mill operations. This is a summary of a preliminary report given by R. C. Sproull, director, Herty Foundation, Savannah. "Giant" bamboo used came from the U.S. Plant Introduction "botanical" garden, at Savannah. (See PULP & PAPER, Aug., 1946.)

Successful use of rapid cycle digesters at the Pilot Rock, Ore., hardboard plant of U. S. Gypsum Co. was described by L. E. Eberhardt, The Bauer Bros. Co. Control of chips entering and leaving the digester is effected with 300 lb., 20-in. gate valves that open in 5 sec., are hydraulically controlled. Functioning is every 10 min. during the 24-hour day. Plant operation began in March, 1954. Production is 120 tons per day using 1100 lbs. of steam per ton.

Review of results from tests of Southern hardwoods pulping and bleaching conducted by The Institute of Paper Chemistry were given

by D. J. MacLaurin, results from constants in cooking, beating, freeness and permanganate numbers being included. White oak is easily cooked; maple, cookable; ironwood, hardest; other oaks in between. Spread of fiber length, fair. Gum, poplar and bay yielded longer fibers than oak; black jack oak and maple distinctly shorter.

SEMI-CHEMICAL INTEREST INCREASES—Information on the semi-chemical pulping process was presented in a well-attended panel discussion, with C. W. Converse, Sprout, Waldron & Co., as moderator. It revealed a greatly increased interest in this type of pulp, as a means of utilizing more species, increasing yield and supplementing almost any pulp grades.

Wood preparation, specifically hardwood pulpwood barking for mass production, presents a challenge to equipment manufacturers to find the answer, according to W. J. Zimmerman, project engineer, Parsons & Whittemore.

Cooking gum chips in a 15-ft. rotary digester was described by K. K. Kirven, Sonoco Products Co., Hartsville, S. C. Steam is admitted at top until shows from bottom. High temperature will "brown" the chips; high velocity will leave "cold" spots. Fast impregnation of liquor is required. Cooking is about four hours at 100 to 120 lbs. at 170° C. Yield is 75%. Neutralizing of organic factors is necessary to prevent corrosion. Pulp is darkened some. About 80% of the sulfite is used up in the first hour's cooking. Mechanical functions of the digesters require little maintenance. A digester 20 years old with 14 years' continuous service is now being replaced.

Continuous cooking with Asplunds was described by W. W. Marteny, National Container Corp., Tomahawk, Wis. Cooking pressure is 175 lbs., with slightly less than 10 min. for the cook. Penetration of ¼-in. chip is in less than 2 min. Process gives control of chips, uniform treatment.

Vertical digester cooking of hardwoods started at North Carolina Pulp, Plymouth, N.C., in 1951, said Joseph H. Keyes, using 80% to 85% gum with balance of birch, maple, and sometimes oak. After the paper mill complained, oak was discontinued due to dark chips. This mill is preparing to change to a neutral sulfite process.

Proper Sprout-Waldron refiner feeding requires (1) capacity equivalent to the refiner, (2) constant feeding without variation, (3) pulp at required consistency, and (4) maximum temperature, according to Chairman Converse. His company has a new rotary feeder followed by a flat bed drain for separation of black liquor with magnetic tramp iron remover and variable speed drive.

Advantages of two stage refining in semi-chemical pulping, according to J. E. Sapp, Gaylord Container Corp., are that the first pass refiner may have coarser discs with less trouble and longer life, while the secondary may be finer to meet paper machine requirements. Also, if a vacuum washer can be placed between two refiner stages, the primary may be adjusted in freeness for the washer, and the secondary for the paper machine.

MORE COOSA RIVER SCENES

(Top) Barbecue pit where guests got barbecued beef and all the trimmings.
(Second) Looking across the 9-hole golf course at Coosa River to the big kraft pulp and newsprint mill.
(Third) Conference delegates saw little pines growing in Coosa River nursery—and Crown Z men took some home to Washington State to grow.
(Bottom) Where pine seeds are shaken from cones warmed up for speeding up the opening of the cones.

Washing of semi-chemical pulp, for which Mr. Wiley of Riegel, was panel member, evoked interesting discussion. What's talked of now, he said, is screening before washing to send the rejects back before the liquor had been extracted. Discussion involved questions of two stage vs. three stage washers; whether you wanted to "wash the face" of the pulp or extract the chemicals; differences in handling 9-pt. vs. board stock.

Single stage bleaching either with massive chlorine or peroxide will produce up to 75 point brightness, with little loss of yield, said D. J. MacLaurin, Institute of Paper Chemistry. Mr. MacLaurin showed figures revealing a high yield of pulp in semi-chemical processes even after bleaching.

In combatting corrosion in connection with semi-chemical pulp production, Larry Murtfeldt, Consolidated Water Power & Paper Co., referred to various installations in which carbon steel could be used. For equipment such as refiners and washers he recommended stainless steel discs and high alloy plates, and stainless in washer parts hard to replace. Screens can be used in bronze, but this was not recommended for impellers.

Mr. Pesch of International Paper, was named chairman to study the digester corrosion problem, the point of which he explained by saying that there has been a change in some way from pre-1935 to post-1935 either in the cooking liquor or in digester metal. His committee will analyze cooking liquor to determine whether something has been left out that formerly was present, or something new introduced.

The Alkaline Pulping Conference in 1955 will be held in New Orleans.

South's Safety Record

For first half of 1954, seven pulp and paper mills in the South showed perfect safety records, without any disabling accidents. These mills and their man-hours of exposure, were: Sonoco Products, Hartsville, S. C. (1,562,831); Crossett (Ark.) Paper Mills (807,013); Buckeye Cellulose, Memphis (638,065); National Container, Big Is., Va. (241,907); Certain-teed, Savannah (230,227); Mead Corp., Nashville (96,854), and Hammond Bag & Paper, Wellsburg, West Va. (25,953).

A total of 58 reporting mills in the South had a frequency rate of 7.58 (injuries per million man-hrs.), for the first half of 1954, down from 8.52 in 1953, and 9.78 in 1952. The highest rate for an individual mill this year was 24.64 and only three were over 20. There were 15 with only 3. or less.

STUDY IN CONCENTRATION

Concentration is just what had to be done by invited symposium members at the Paper Machine Fundamentals meeting in Appleton. Practical mill men, known in the industry, may be spotted in this picture. For instance, in third row, extreme left (in glasses) is F. L. ZELLERS, Mill Mgr. at Chillicothe Paper Co. Extreme left in second row is JOE CHAPMAN, Chemical Engineer of Albert E. Reed & Co., England, next to him, JOHN R. CURTIS, Scott Paper's Machine Development Engineer. Man with beard in front row is DR. HERBERT F. RANCE, from Wiggins Teape mills of England.

Review of Papers and Discussions

What authorities on paper machine reported—disturbing some popular beliefs, describing new ingenious devices

By ROBERT T. ELIAS
Assoc. Prof. of Paper Technology, Western Michigan College

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Fundamental research is aimed at total mastery of a medium.

It is mentally demanding, that is true, but when it reaches its goal then unpleasant surprises are avoided in regular operation, and long strides into the future can be made with confidence. "Fundamental" means broad in scope; it means applicable over a constantly broadening front as we progress. The untold advantages of a basic fact make this kind of research fascinating and potentially most profitable.

The two fundamental research committees which sponsored this symposium are to be congratulated, and their chairmen, Harry F. Lewis and Kenneth C. Logan, must be commended for a valuable job well done. The Institute of Paper Chemistry was an excellent host, and it was a privilege to attend. Without exception, the papers were stimulating, and it was exciting to see the progress which has been made, to catch the visions of the future and to observe the quality of the men who will shape the future.

"Flow in Fiber Suspensions and the Effects of Turbulence."—J. A. Van den Akker, Institute of Paper Chemistry.

"Fiber Motions and Flocculation"—S. G. Mason, Pulp and Paper Research Institute of Canada.

"Hydraulics of Flowbox and Slice"—W. van der Meer, Van Gelder Zonen N. V., Velsen, Holland.

The first paper introduced the sub-

Interpreting Symposium in Language of the Mill

What were the significant points developed at the recent International Symposium on the Fundamentals of the Paper Machine, held at the Institute of Paper Chemistry?

Written especially for PULP & PAPER readers by Robert T. Elias, associate professor of the Paper Technology Dept., Western Michigan College, this review tells what were the important highlights at Appleton, stressing the points that would have practical application in the mills, and bringing out what it all means for the future of papermaking.

Mr. Elias has written this special article for management men and supervisory men in the production fields of the mills and paper companies.

Mr. Elias was born in Appleton, Wis. He graduated from Lawrence College and continued three years for a masters degree at the Institute of Paper Chemistry. He worked with Detroit Sulphite Pulp & Paper and Whiting Plover Paper Co., getting practical experience before joining the faculty of the new Kalamazoo paper school nearly three years ago.

ROBT. T. ELIAS, Associate Prof. of Paper Technology, Western Michigan College.

ject of hydrodynamics and indicated the applicability and limitations of classical theory based on clear water. Dilute stock acts much like clear water, but the presence of fiber suppresses turbulence. Very low intensity turbulence aids flocculation, higher causes deflocculation. Turbulence is difficult to express numerically, and the usual measuring instruments fail in stock.

It was suggested that some non-uniform flow under a slice may arise from variability of small scale turbulence and consequent influence upon apparent hydrodynamic resistance of the slice.

By calculation, it was shown why fibers do not align themselves with a stream unless velocity gradients are present and that in vortexes, centripetal acceleration of a fiber relative to water is negligible.

The van der Meer paper discussed the application of hydraulic principles to the design of approach-flow channels, headboxes and slices. Many practical suggestions were offered, often with factual data. For example, when stock flows in a widening vertical canal, the maximum angle (between the two walls) at which the flow will follow both walls is about 12°. If, however, a "holey" roll centers where the divergence begins, the angle is 14 2/3° and if the roll center is one-half diameter later, the angle becomes 32°, making possible shorter canals.

Vortexes may form behind vertical slices and will shift sideways. Conditions of their formation were given, and slanting of the wall above a slice was recommended. Fixed whirls behind baffles and in bends and tee pipes were discussed, and in the case of broad bends, Venturi construction was recommended if mixing is desired. Cross-spreaders, with opposed tapering channels were mentioned, as were also the effects upon a baffled flowspreader of feeding it from one centrally located screen or two screens at its edges. In the latter case, vortexes form in the middle rather than at edges.

Design of "holey" rolls and their location in headboxes was given much attention and numerous examples were cited of actual headboxes in commercial use.

In the following discussion, much interest was shown in "frozen flow" headboxes (Canadian Patent) in which, it is claimed, stock comes to the wire with absolutely no turbulence.

Mason reported observations of individual fibers as they were held stationary in respect to a microscope, yet caught between liquid currents of differing velocities. That is, adjacent currents were in opposite directions,

From Symposium's Chief Organizer

Dr. Harry F. Lewis, Co-Chairman of Symposium and Dean of Institute of Paper Chemistry, cites conference as symbol of international cooperation in field of science

• As a symbol of international co-operation in the field of science and technology, the Symposium on the Fundamentals of the Paper Machine held Sept. 20-24 at The Institute of Paper Chemistry is worthy of being rated highly. It was sponsored jointly by the fundamental research committees of the CPPA (Technical Section) and of Tappi.

Its four sessions were chaired on two days by Canadians and on the other two days by their opposite numbers from the United States. Its 18 papers were presented by five from Canada, three from Sweden, four from Great Britain, one each from Holland and Finland, and nine from the United States. Its discussion leaders included four from Canada, one each from Germany, Great Britain, and Sweden. Its members included the chairman of the British Pulp and Paper Manufacturers Research Association and the president of Tappi—the registration list numbered 281, made up of 24 Europeans and 41 Canadians, with the remainder from this country.

In general, four papers were presented daily—three in the morning and one in the afternoon immediately after lunch. After the first paper, coffee and doughnuts served in a large tent on the Institute grounds provided a welcome break and the opportunity to circulate (one of the main attractions of any conference). At 3 p.m. each afternoon the symposium reconvened with the speakers stand replaced by a semi-circular table equipped with microphones and other facilities for a panel of ten. The chairman of each day served as panel moderator. The speakers and "discussion leaders" who covered the particular papers formed the panel. Questions were submitted either in advance of the meeting or at the meeting, by way of question boxes placed at appropriate locations or from the floor during the discussion. The value of the panels was greatly enhanced by the prior distribution of pre-prints of the papers. These added greatly to the effectiveness of the various presentations, for many speakers were thus able to speak to important points of their papers (pre-prints weighed a little less than 3 lbs. each and 200 or more were mailed out in advance).

WHAT WERE SUBJECTS—The first day was devoted to the properties of fiber suspensions of interest in the design and operation of the headbox and slice. During the second day the phenomena occurring on the moving wire provided both papers and discussion; these dealt especially with filtration resistance, water removal by table rolls, wire vs. stock speed, and effects of these on the nature of the sheet. On the third day the speakers discussed the properties influencing the wet web and the removal of water therefrom by the felt and in the press section. The final program covered the effect of drying and calendering on the properties and processes. Several incidental papers dealing with special devices were given during the week—one on the stroboscope as an instrument for studying wet end operation, a second discussing a dynamic suction box for laboratory studies on sheet properties, and a third describing a device for measuring paper machine draws and speed variations.

Although this was in every sense a working meeting with sessions from 9 a.m. to 5:30 p.m., opportunities were on hand for becoming acquainted with people of like interests from other parts of North America and Europe. The majority of the registrants spent Monday at the Institute, seeing its facilities and visiting among themselves; no formal program was carried on. Lunch was served each day at the Appleton Elks Club. Wednesday evening was given over to an informal dinner at Riverview Country Club and Thursday evening to a meeting of the Lake States Section of Tappi with an address given by Dr. Börje Steenberg on "Principles of Screening System Design."

At the end of the week the symposium members returned to their mills with notebooks full of ideas, their heads reeling under the impact of the complex mathematics involved in the discussion on the elastic theory of nip stresses, which was the last paper, and with a feeling that the meeting had been worthwhile. The sponsoring committees saw the end of the week with both relief and a certain degree of satisfaction. Readers should derive some value from publication of the 18 papers and the 370 or so typewritten pages of discussion which will appear in *Tappi* and in the *Pulp and Paper Magazine of Canada*. And not least of the benefits—many who went back to their various countries will have benefitted from broadening their acquaintance among others of like interest.

SIGNING UP FOR INTERNATIONAL SYMPOSIUM

Registering for star-studded research meeting (l to r.): KEN C. LOGAN, Canadian Co-Chairman and Director of Development, Northeastern Paper Products Ltd., Quebec City; WILLIAM S. RICHARDSON, Engineer, S. D. Warren Co., Maine; C. A. SANKEY, Research Director, Ontario Paper Co.; DR. H. F. LEWIS, American Co-Chairman and Dean of the Institute, and FLORENCE LANGRILL, his Secretary, and the Registrar.

and the fibers at the boundaries followed neither current. A special Couette-type apparatus made this possible, and, in fact, excellent moving pictures were shown of actual fibers in action.

Tiny glass spheres were also studied, and under the conditions, they were seen to spin. Smooth cylinders also rotate, but in more complicated fashion. Wood fibers act similarly, but, in addition, exhibit flexibility.

Two spheres upon colliding would form temporary doublets and revolve like rigid dumbells for calculable lengths of time; the number of doublets present at any instant being calculable and representing a degree of association or "flocculation." Rigid cylinders need not actually collide. An interpenetration of orbits can occur. Fiber association is complicated by their bending and appears to be favored by increased flexibility. This mechanical entanglement is believed to be the first step involved in paper stock flocculation.

Discussion following this paper inquired as to the deflocculating effects of locust, bean, gum, etc., in view of the above conclusion, and it appears that no contradiction exists.

"Model Experiments of Sheet Formation on the Cylinder Wire"—Borje Steenberg, Jan Bergström, and R. I. Kjensjord, Swedish Forest Products Research Laboratory, Stockholm.

"Stroboscopic Observations of the Wet End"—C. C. Porter, Southland Paper Mills, Inc., Lufkin, Tex.

"Filtration Resistance of Pulp Slurries"—Roy P. Whitney and W. L. Ingmanson, Institute of Paper Chemistry.

"Quantitative Study of Water Removal by Table Rolls"—W. E. Bennett, British Paper & Board Industry Research Assn.

"Influence of Differential Speeds between Stock and Wire on Sheet Properties"—O. Andersson and J. Bergström, Swedish Forest Products Research Laboratory, Stockholm.

"Drainage Effects and Two-Sidedness"—George F. Underhay, Bowaters Development and Research Ltd., London.

"Laboratory Investigation of Water Removal by a Dynamic Suction Box"—Lars Nordman, Research Institute of Finnish Pulp and Paper Industries.

The next seven papers dealt with what happens while a sheet is forming.

Steenberg described experiments, imitative of cylinder machine operation, in which, however, flowing stock was sucked up by a stationary head and deposited on a horizontal wire surface.

It was found that basis weight was less than proportional to the amount of water drained through the wire, and it is believed that, therefore, the existence of a "wash-off" effect has been established. This effect was found more pronounced at higher velocities of stock. Some fibers, not completely embedded in the sheet are believed torn off and carried away by the stream, this action being more likely with longer fibers. Consequently, the cylinder mould would act like a fractionator, more so as basis weight builds up.

These observations agree with data from commercial operations, of both direct flow and counter-flow vats, where consistency and freeness away from the inlet are always higher than at the inlet. Counterflow vats present to the naked wire the freeest and most concentrated stock, through-flow the reverse; and rates of fiber deposition are thereby affected. On the basis of these commercially observable facts and data of the above experiments, Steenberg explains certain sheet characteristics and also the greater need of overflow in direct-flow vats.

Porter's paper included an interesting micro-flash photograph of stock on a 1500 fpm wire just after the slice. Other photographs showed paper machine peculiarities not otherwise observable even by trained observers. The main purpose, however, of this paper was to call attention to certain flash equipment as being a valuable research tool.

Ingmanson and Whitney advocated further the concept of average specific filtration resistance as an important property of papermaking fibers. Ingmanson had previously reported a constant-pressure technique of measuring this property. In this paper, a

FOUR LEADERS FROM FOUR NATIONS

PROMINENT GROUP at International Symposium talk it over (l to r.): DR. W. BOYD CAMPBELL, Pulp & Paper Research Institute, Montreal, who Chairmanned a day of sessions: OTTO BRAUNS, Central Laboratory of the Swedish Paper Mills; LARS NORDMAN, Head of Paper Dept., Research Institute of Finnish Pulp and Paper Industries, and WESTBROOK STEELE, President of Institute and host to the gathering.

STAR PERFORMER—4TH TRIP TO U.S.

DR. BORJE STEENBERG, Director of Swedish Forest Products Research Laboratory, Stockholm, was on his fourth trip to America since 1948. He caused a bit of a stir in Symposium when he presented written paper by associates on cylinder formation, but didn't read it—it served as "springboard" for his talk. He met several young former students at Appleton, also addressed Tappi section there.

constant-rate technique is advanced as simpler and faster and affording from one experiment the filtration resistance at any desired pressure differential. Exclusive of sample preparation time, a complete determination requires fifteen minutes.

To study the fundamental properties governing filtration resistance, the Kozeny-Carman equation was used, involving among other variables, specific surface and effective specific volume. Filtration resistance is proportional to the square of the specific surface. For eight unbeaten pulps out of nine, specific surface by this method agreed within 5% of that found by silvering. Where disagreement was found for unbeaten pulps, the filtration technique gave the higher values.

Plotting filtration resistance vs. freeness showed freeness to be very insensitive at high values and to exhibit great inversions of ranking at lower values.

It is argued that when table roll suctions can be determined and if the validity of an existing formula for machine drainage can be established, the concept and measurement of average specific filtration resistance and the factors which determine it will be highly useful.

W. E. Bennett reported drainage data from individual table rolls of a newsprint machine in commercial operation at 609-692 fpm. No attempt was made to hold conditions constant, changes occurring as the machine operators deemed advisable. Six factors were chosen for multiple regression analysis for each table roll in turn: Wire speed, temperature, flow box consistency, freeness, sheet machine drainage time and fiber length index. By far, the largest factor influencing

From Operations Executives . . . .

24 Europeans participate in "once-in-four-years" sessions; managers and superintendents listen

● A star-studded galaxy of world renowned authorities on the physics of the papermaking process scintillated through four memorable days in the new auditorium of the Institute of Paper Chemistry in Appleton, Wis., in late September.

It took four long years of negotiation and planning to bring together this formidable assemblage of scientists from leading pulp and paper countries of Europe and the Americas. An Australian would have been there, too, but he missed his travel connections.

There were four days of wisdom—and of wit, too, for among them were brilliant men, for whom such a international gathering of nearly 300 researchers and industry leaders sharpens their utterances, like a colorful football crowd stimulates a halfback.

The subject—the papermaking machine, both Fourdrinier and cylinder—was given a verbal scientific working-over such as it probably never experienced in any meeting ever held before. PULP & PAPER went to the meetings as an invited member of symposium, and in these pages brings to its readers a summary of the serious side—what it was all about and what it means to this industry. Also some of the witty repartee—if you care to read a little further.

There were 28 Europeans at the meeting—distinguished engineers and research men from Britain, Sweden, Finland, Holland, Germany, Italy. A big delegation came from England, several of them continuing on tours of the United States. Incidentally, with their arrival came word that some British mills for the first time in centuries have plans to make some of their own pulp from unused British "weed" trees, by new American semi-chemical methods.

There were 41 Canadians at the meeting. Actual total registration was 282, but there were other stragglers. The technical associations of Canada and U.S. were sponsors. Dean Harry F. Lewis of the Institute of Paper Chemistry, and Ken Logan, director of development, Northeastern Paper Products, Quebec City, co-chairmen of the fundamental research committees of the two countries, spearheaded four years of work in arranging for the sessions.

MANY OPERATIONS EXECUTIVES—Perhaps the most significant and interesting sidelight on this performance at Appleton was the large number of mill operations executives who came to the sessions and took a keen though silent interest in the proceedings.

How times have changed in this industry! It wasn't so many years ago that men in such positions couldn't have been dragged to this type of meeting. But they filled many of the seats in the auditorium and two anterooms, where the overflow heard discussions by loudspeakers. Mill managers, mill superintendents, operations engineers as well as development engineers—you could spot them all around the place.

There were men like Cap Youngchild, consultant; Alfred Suter, Gaylord's general supt.; Henry Baldwin and Bill Foote, Consolidated Water Power & Paper mill manager; F. L. Zellers, mill manager, Chillicothe Paper; George Balko, assistant to president, Richmond P & P Co.; R. A. Diehm, exec. v.p. of Ward Paper; Geo. Mackin, exec. v.p., Green Bay P & P Co.; John McDermott, new resident mgr., St. Regis, Jacksonville; Foster Doane, Jr., production mgr., Bergstrom Paper; G. S. Douglas, manager at Escanaba Paper Co.; G. D. Muggleton, vice pres. and mgr., Combined Locks; Roy A. Meunier, mill supt., Morris Paper Mills; Leonard Parkinson, paper supt., and Sigge Ekman, pulp supt., Rhinelander; H. B. Urquhart, assistant manager, Powell River Co.; Myles Reif, exec. v.p., Blandin Paper; Bob Rusch, paper supt., Mosinee; George Sheets, new assistant mgr., Mead's Kingsport mill; and Bill Schlafge, new general mgr. for M & O, International Falls. George Pringle, Mead vice-president, came in his role as Tappi president, and stayed to hear papers.

This is not to suggest that the above-named are not technically trained. Some can be called doctor, but prefer not to be. But they also have been literally "though the mill" in a practical sense of the word. They got paper on the wire the hard way, and some may suspect that researchers couldn't do that.

What it means is that this industry today demands a high order of technical knowledge in its management and production executives. That's why they were in Appleton.

President Westbrook Steele, greeting the assemblage, expressed the

Elias Review Continued

drainage was that of speed. Temperature rise favored drainage, but mainly from roll ten onwards. The other factors were of doubtful or insignificant effect as a rule.

Data were presented which indicated by direct measurement of suction in water nips of table rolls that suction varies directly as the square of the wire speed, confirming the deductions of Wrist. A small roll was found to suck as strongly as a longer but to remove less water because of a smaller nip.

On the news machine, near the breast roll gravity drainage overwhelmed suction and drainage did not increase with speed. There and there

2 SWEDES FROM DALARNA

It was "old home week" for these two Swedes, both from Dalarna province (which means "The Valleys"): DR. OLLE ANDERSON, (left) who was promoted to Head of Physical Chemistry Division of Swedish Forest Products Research Laboratory, in Stockholm, while spending past year in Canada on exchange professorship, and JOHN V. ROSLUND (right), of Portland, Ore., who represents Downingtown, Asten-Hill and other lines on Pacific Coast.

only, consistency had significant effect. Immediately thereafter, suction became predominant and was compatible with the square law. Still later, the speed effect fell off, evidently due, in part, to compression of the wet web.

Anderson spoke of experiments on the experimental paper machine of the Swedish Paper Industry Central Laboratory in which wire speed was varied from 100 meters per min. to 200 and stock speeds were at various ratios to those wire speeds. Samples were taken just after the couch, pressed and dried. While some properties did not vary appreciable with speed of stock, others showed maxima or minima, and at a given wire speed these points all occurred in the same region of stock speed. That is, least anisotropy of fiber orientation and mechanical properties was obtained at wire speeds somewhat faster than stock speeds, the optimum speed difference increasing almost proportionally with the speed of the wire. Thus it appears that the authors confirmed the wisdom of usual commer-

More From Operations Executives

hope that the Institute would continue to be "an area for meetings of this character." It probably will, but the fundamental research committeemen agreed that the earliest date for another meeting of this character would be 1956 or 1957, and it is Canada's turn to host the next one. The Appleton meeting was an outgrowth of a 1950 research meeting in Canada on the fundamentals of fiber. "What happens to the fibers on the machine," was the theme of this sequel session in Appleton. None of the leaders were willing to conjecture what would be the fundamental topic for '56 or '57.

Some managements, whose mills were close to the Appleton conclave, sent different pairs of men each day.

WHAT OPERATIONS MEN THOUGHT—What did the hard-bitten operations and production men think of it?

Here's what they told a PULP & PAPER editor:

"We found out a lot of things we took for granted in our mill are not necessarily right or good."

"We can't put into practice some things we heard as quickly as tomorrow, but the talks put our feet back on solid ground."

"I'll confess a lot of it was too deep for me, but what I did get out of it was good."

"Management men had better come to these meetings. Otherwise, some day their competition is going to suddenly turn up with a way of making paper that will put them behind the 8-ball."

"Our company has already done a lot of this work. We should have had more discussion."

"I got a better idea of the true fundamentals of papermaking. It was a very well-organized meeting, but a lot of concentrated stuff."

"There were too many papers—18 of them in all, as well as long discussions. No one could absorb all that, but then we have to remember a lot of speakers came a long ways. It probably had to be this way, or not at all—all in one big dose."

"I learned more about cylinder formation in a half hour of listening to Dr. Steenberg than I could in years of mill operating. I am going home and make my own tests of some of his theories."

The comment that probably best epitomized the vast scope of such a symposium on papermaking was this one by W. E. Bennett, of the British Paper and Board Industry Research Association:

"A colleague once told me he had counted up 72 variables affecting the wet end operation of a machine."

Kimberly-Clark Corp. alone had some ten representatives taking part or listening at this meeting, exemplifying the interest shown by one of the most progressive companies.

Attending were Vice Pres. W. H. Swanson; Asst. Chief Engineer Rusty Johnson; Dr. John C. Wollwage, technical research director, who presided the 4th day; Henry W. Bennett, hydraulic research, a discussion leader; C. A. Lee, in charge of the Neenah hydraulic lab; Homer E. Malmstrom, Neenah research physicist, who co-authored a paper; Dr. Myrle M. Davis, associate technical director; John Huppler, chief of the paper division, Neenah; Rudy Moravic, Neenah, as well as R. F. Baer, design engineer from the K-C operated Coosa River Newsprint Co.

THE LIGHTER SIDE—Lars Nordman, head of the paper dept., Research Institute of the Finnish Pulp & Paper Industries, Helsinki, Finland:

"Once a Swede came to Finland and gave a paper in Finnish. When he was through, a Finn who had been listening most attentively, said: 'I never knew that Swedish was so easy to understand.' "

Jasper Mardon, Northeastern Paper Products, Quebec, a discussion leader:

"First of all, we will have the discussion on his written paper, and then we will have the discussion on the paper that Dr. Borje Steenberg actually delivered."

This one will be nameless—"If those blankety-blank papermakers put the stock into the headbox correctly there wouldn't be any need for 'holey' rolls, which are there just to correct an error made in the first place."

George F. Underhay, head of research and development for Bowater's, London, topping off a discussion of the behavior of fibers on a Fourdrinier:

"Could we just make this point—as Prof. Steenberg did regarding cylinder machines—that the shake is an inadvertence to the papermaker who makes paper properly. He gets his fiber on the wire, and then he shakes the wire with those fibers stuck on it in the hope that the little fibers may hit little holes where the suction is a little more accommodating, and the suction may make up a decent sheet."

From the lips of Britishers and old-country-talking Canadians who took part, the audience heard "la-bor-at'ry," and from Americans and other Canadians they heard "labora-tor-y." But the main point was that everyone, from all the various countries, understood each other, and learned from each other, and that's what the meeting was all about.

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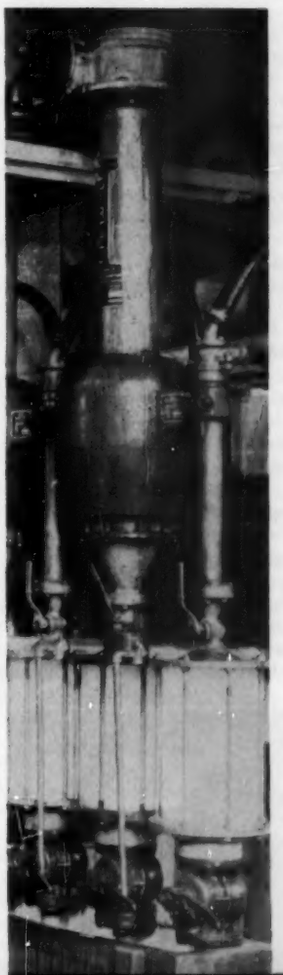

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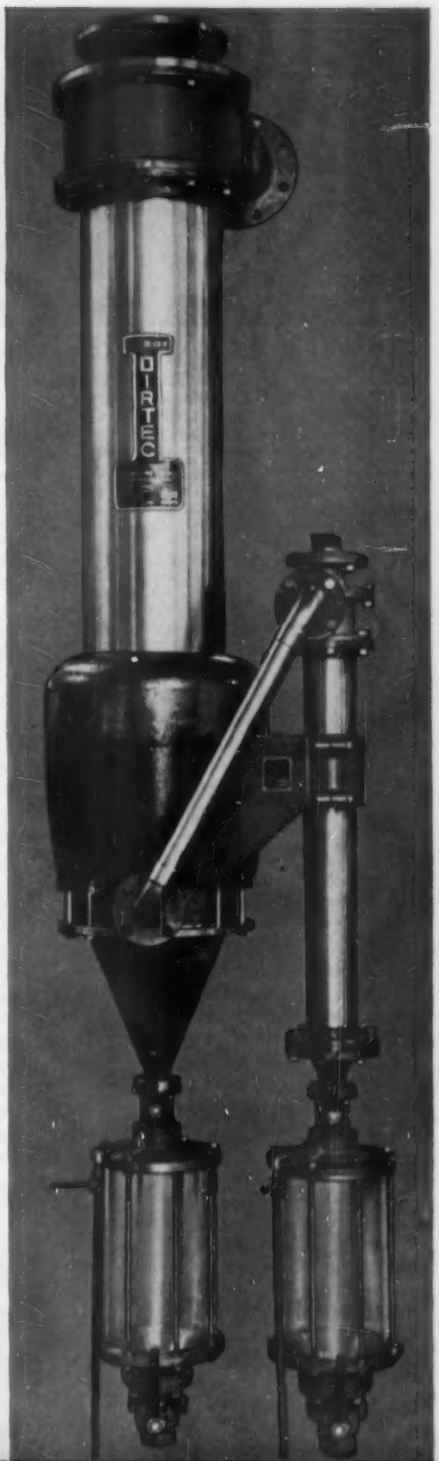

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SIX GAVE PAPERS—ONE ASKED QUESTIONS

Left to right: DR. JOHANNES A. VAN DEN AKKER, Appleton Institute, who led off symposium with an outstanding work on fiber flow on machines; BERTIL IVARSSON, Dr. Steenberg's chief assistant at Swedish Forest Products Lab, now on leave with Beveridge Paper Co., Indianapolis, as consultant on stereotyping; W. E. BENNETT, British Paper and Board Industry Research Assn.; DALTON L. SHINN, Central Research, Crown Zellerbach; LARS NORDMAN, Head of Paper Dept., Finnish P & P Industries Research Institute; GEORGE F. UNDERHAY, Bowaters Chief Tech. Director and head of its subsidiary, Bowaters Development & Research Ltd., and HENRY W. BENNETT, Hydraulic Research specialist for Kimberly-Clark, a discussion leader. All gave papers except Mr. Bennett.

cial practice.

Best isotrophy and closest structure were obtained by delaying dewatering, by use of an apron, with moderate drainage. Earlier and more intense drainage gave more orientation but better formation.

Underhay disturbed some popular beliefs about two-sidedness. First, he cited examples of composition differences between the two sides of sheets. For these analyses, sheets were split by sticking them between gummed papers. Laboratory hand-sheet attempts to duplicate machine two-sidedness were all failures, indicating that neither straight drainage nor drainage augmented by suction caused two-sidedness. When, however, a rapidly oscillating vertical movement was introduced between the wire and the draining sheet, machine two-sidedness was imitated. This led to the belief that on a machine two-sidedness arises from water clinging to table rolls coming around and wedging between wire and the rolls and being forced through the wire, washing fines from the bottom of the sheet.

Considerable comment arose from Underhay's observation that despite more than 2:1 differences in ash content between top of sheet and bottom, in a supercalendered groundwood-sulfite sheet, no significant difference in printability was found between top and bottom.

In Nordman's paper, an ingenious laboratory device was described which applies suction to handsheets for time intervals approaching those occurring on fast machines. A moving suction box was employed, with three speeds, giving suction times of 0.117, 0.089 and .076 seconds. Sheets were formed in a laboratory mould under no head except that of the pulp suspension itself. 3-5% dryness resulted, about the same as on a paper machine after the table rolls. These sheets were then extracted by the moving suction box, which was connected to a constant capacity pump.

When suction starts, only water comes out of the sheet. Later, air begins to come through the sheet. The point, in relation to width of the suction zone, where air begins to flow depends on the quality of the pulp, and a sheet which loses its water readily and allows more air to pass yields a lower vacuum.

Basis weight variations had small effect upon dryness after suction. Temperature rise favored dewatering. Variation of suction time (the inverse of machine speed) had rather surprisingly small effect upon dryness. A straight line inverse relationship was found between dryness and fines content of pulp. Though freeness is extremely sensitive to variations in fines, freeness was not found to define dewatering properties under suction. At equal freenesses, groundwood gave higher drynesses than did unbleached sulfite in spite of much higher vacuums with groundwood. Sulfate acts differently from sulfite. Mixtures of groundwood and sulfite were studied, with interesting results. The moving suction box is said to have been used in studying wet web strength, and Nordman carefully distinguished between dryness, the subject of this paper, and web strength, which is a more complicated subject.

"Fiber Properties and Fiber-Water Relationships in Relation to the Strength and Rheology of Wet Webs"—Wilfred Gallay and L. M. Lyne, The E. B. Eddy Co., Hull, Que.

"The Effect of Wet Pressing on Sheet Properties"—D. J. MacLaurin and J. F. Whalen, Institute of Paper Chemistry.

"Introduction of Stress into a Paper Sheet on Drying"—Bertil Ivarsson, Beveridge Paper Co., Indianapolis. On leave from Swedish Forest Products Laboratory.

"Effect of Water Removal on Sheet Properties—The Water Evaporation Phase"—Herbert F. Rance, Wiggins

TOURING AMERICA—FROM COAST TO COAST

This trio from Britain, after the Appleton Symposium, continued a 6 weeks tour to mills such as Powell River and Crown's Camas mill on West Coast, Union Bag in South, Brown Co. and Glatfelter in East. Left to right: JOE CHAPMAN, a Symposium discussion leader, Chemical Engineer for Albert E. Reed & Co. Ltd., stationed at their Maidstone Central Laboratories, 35 mi. east of London; FRED AMIES, Chief Papermaker for Reed & Co.'s London mills, making printings, gummings, gravures, etc., and ANDREW FORBES, Asst. to Chief Engineer, Reed's Aylesford mill.

Teape Mills, Bucks, England.

Four papers dealt with strength development on the paper machine, following it all through the dewatering process, and bearing upon the theory of how bonds are formed.

Lyne and Gallay had previously reported investigation of strength development in wet webs with increasing solids, using unbeaten pulps and untreated glass fibers. The present paper extended this work to the effects of beating and wet pressing.

Previous work had revealed discontinuities in strength development plotted vs. moisture contents. It was suggested that, in drying, one mechanism suceeds another as main operative force contributing to sheet strength, surface tension dominating up to 20-25% solids, and inter-fiber bonding dominating thereafter. With glass fibers, which do not bond, strength was maximum at 20-25% solids, then fell off as water and surface tension effect disappeared.

Wet pressing and beating had similar effects in that they cause the discontinuities to disappear. They increase density without corresponding water removal and are thought thus to favor both surface tension and earlier development of inter-fiber bonding, extending the range of each effect, overlapping them and obscuring transition from one to other.

Below 45% solids, webs of beaten pulp are less dense than those of beaten, it was shown, but they are nevertheless stronger at equal solids content. It is proposed that this may be due to earlier onset of inter-fiber bonding as a result of enhanced swelling of the fiber and its greater plasticity.

The percentages of air voids in wet sheets were calculated. Since they influence the extent of air-water interface, the authors attached great importance to void percentages in explaining strengths of wet webs prior to the predominance of bonding.

Load-elongation tests were made on wet webs, some with a new instrument capable of heavier loads than that previously described. Again it was found that the 20-25% region was one of change. The rheological properties of wet webs down to very low solids bear remarkable similarity to those of dry webs. The authors developed an interesting theoretical picture relating these properties to their concept of air-water interfaces holding fibers together, distorting under stress, breaking and re-forming.

Ivarsson and Rance, in their papers, covered much the same area—the drying of wet webs, their shrinkage, their extensibility, their strength—but in their theorizing, Ivarsson took the dynamic approach, thinking of the wet sheet as an approximately elastic gel, while Rance took a mechanistic approach, thinking of separate fibers.

Ivarsson was particularly interested in the effects of draws and other tensions during drying, and he used an instrument similar to that of Lyne and Gallay, an automatic stress-strain recorder adaptable to wet sheets. This device showed how drying causes shrinkage and how restraint during drying changes stress-strain properties of the dry paper—increasing tensile strength and decreasing extensibility.

A theory by Barkas relating external stress to shrinkage and moisture change in an elastic gel was found to apply well if shrinkage occurs under no load, but since paper shows plastic flow under tension, the formula gives too large values for the drying stresses. Due to plasticity, longer strips give larger drying stresses, whereas for an elastic get during drying, the stress should be independent of sample length.

It was found that paper from more beaten pulp will develop equal drying stresses at higher moisture contents, and a chart was developed which gives complete information about the differential speed required in a drying section for any changes in stress or moisture content.

Rance dwelt upon a distinction between web contraction due to surface tension between fibers and that due to fiber shrinkage and suggested that inter-fiber contraction within the plane of the sheet is largely irreversible whereas intra-fiber contraction is largely reversible and can be roughly estimated through the water expansivity of the dried paper. A third type of web contraction due to the twisting of fibers on drying was suggested as occurring among unbeaten fibers but not possible among beaten.

A theoretical picture was built up of fibers first bonding to others and then being crumpled or axially compressed as the others undergo shrinkage. On this basis, shrinkage effects upon drying were explained, and also the extensibility of freely shrunk paper, as it is thought to involve straightening of crumpled fibers.

In respect to thickness, inter-fiber expansion on rewetting is considerable. This can be greatly reduced by wet-strength bonding, which, however, does not affect planar expansion. Therefore, it is believed that planar expansion must be due to intra-fiber movement.

In the following discussion, James d'A. Clark expressed unhappiness that in the papers presented the development of fibrillae had been largely disregarded in the theoretical explanations.

MacLaurin reported experiments

AFTER THEY HAD AT THEM

WESTON T. BENNETT (left) Chief Engineer for all Canadian International Paper Co. mills, and KEN C. LOGAN (right), Symposium Co-Chairman and Development Director for Northeastern Paper Products, reviewing the discussion of what happens to fibers over wires. They led off in questioning speakers.

THEIR COMPANY HAS BIG STAKE IN BETTER PAPERMAKING

R. E. FISHER (left), Director of Research at the Springdale, Conn., Laboratories of Time-Life magazines, and PAUL THOMA (right), in charge of Testing, Evaluation and Development at the Springdale institution. They were interested listeners at Appleton paper machine symposium because at Springdale their company is spending $1,750,000 this year seeking better ways to paper, ink, presses, etc.—all that goes into an annual $80,000,000 annual production bill for Time-Life (half of it for paper). See Time Laboratory article—PULP & PAPER, July 1954.

TWO AMERICANS HAD LEADING ROLES

COVER C. PORTER (left) Assistant to the Manager, Southland Paper Mills, Lufkin, Tex., checks over paper he gave on how his newsprint mill uses stroboscope to "stop" the high speed screening action on a machine for close observation. JOHN C. WOLLWAGE (right), Director of Technical Research for all Kimberly-Clark mills, was Chairman and Moderator of discussions for entire final day of sessions.

on Douglas fir, the object of which was by wet pressing to achieve higher bursting strength, as by refining, but not at expense of tear and drainability.

Repeated pressings at lower pressures were found not as effective in raising burst as a single pressing at higher pressures, but there is a pressure maximum beyond which little is gained, and this is true at different freenesses. It appears that a sheet can be compacted so far and no further, unless fiber crushing is resorted to.

Sheet density-strength relationships were found not to be independent of refining, and it was remarked that it is quite apparent that refining is more effective than wet pressing in raising burst. On the other hand, high correlation between burst and dryness after pressing indicated strong possibilities of raising burst through wet pressing.

CO-AUTHORS TALK IT OVER

JASPER MARDON (left), snappy tongued discussion leader from Northeastern Paper Products Ltd., Quebec, chats with W. VAN DER MEER, from Holland's biggest paper company, Van Gelder Zonen N. V., who gave paper on flowbox hydraulics. They have written another paper together. Dutch firm has five paper mills and also Holland's only woodpulp mill.

"The Functions of the Felt in Water Removal on the Papermaking Machine"—Alfred H. Nissan, Prof. of Wool Textile Engineering, Dept. of Textile Industries, The University, Leeds, England.

Adapting an equation by Palmer, Nisson showed that, as far as dewatering is concerned, the requirements for a wet felt are: (1) high compressibility, or low modulus of compression, (2) high recovery at rapid rates, or high values of resilience, and (3) high permeability to water; and he suggested that felts be evaluated by measuring compressibility modulus and rates and extent of recovery at the beginning and end of, say, half a million high speed cycles under water at appropriate pH.

Going to drier felts, Nissan advanced the hypothesis, while recognizing the force of other theories, that entrapment of air between sheet and drier, and subsequent expansion of

NON-TECHNICIANS TRADE NOTES

GEORGE GRAHAM (left) Administrative Coordinator for Institute of Paper Chemistry, chats during coffee break in the big tent with ROBERT E. KISSEL, Gen. Supt., Charmin Paper Mills, Green Bay. Mr. Kissel is member of a family famed in auto industry, as his name obviously reveals, but liked papermaking better.

that air, forces liquid water into the drier felt. He suggested that, if this liquid absorption occurs to an appreciable extent, the design of drier felts can be modified to take advantage of the fact, and also greater use of felt driers would be desirable.

"The Evaluation of Paper Machine Stock Systems by Basis Weight Analysis"—George Burkhard and Peter Wrist, Quebec North Shore Paper Co., Baie Comeau, Que.

Burkhard and Wrist showed how to handle large masses of cross-machine data obtained by a beta ray gauge and from large numbers of varying profiles to extract profiles characteristic of the particular paper machines from which they came. These derived forms undoubtedly are determined by headbox designs, slice settings, etc.

A scissors gauge was devised for traveling across a paper machine and measuring slice opening during actual machine operation. The profile so obtained was found to differ from that which prevails when no stock is passing, and between this slice profile and the basis weight profile derived as above a highly significant correlation was found.

Work is in progress on the analysis of machine directional variations for periodicity, and in this paper a correlogram is shown which reveals clearly two otherwise non-evident periodicities.

"Measurement of Paper Machine Draws and Speed Variation"—Dalton L. Shinn, Crown Zellerbach Corp., Camas, Wash.

Shinn described a portable and inexpensive device which not only measures machine speed and draws but also determines variations in speed and draw. For speed measurement, revolutions of measuring wheels are automatically counted, while for study of speed variability an oscilloscope is employed.

The equipment operated very satisfactorily and withstood without damage much shipping and travel. It provided useful information as to comparison of various types of machine drives and in several instances detected undesirable speed fluctuations.

"Elastic Theory of Nip Stresses and Hysteresis Effect"—Homer E. Mahlmstrom, Kimberly-Clark Corp. and John P. Nash, University of Illinois.

Mahlmstrom and Nash presented perhaps the best example in this series of a fundamental approach resulting in a practical formula which actually did predict beyond the range of experience and which can be used again with confidence. A new supercalender was to be built. The formula accurately predicted the horsepower required, and in the case of several existing calenders it showed the effect of having a softer filler in the paper rolls.

In connection with this derivation, an optical device was built for measuring the hardness of filled rolls.

As a supplement to this work, a formula was developed showing why filled rolls burn out where they do and predicting the distance below roll surface at which burnout will occur.

In photo, Dr. Rance, left; Dr. McCarthy, center; and Robert Gladstone, Prod. Mgr. for Wiggins Teape, at right.

Joe McCarthy Finally Got Out of That Room

The fact that Dr. Joseph L. McCarthy, of the University of Washington faculty, was locked inside his room at the Conway Hotel in Appleton, on the first morning of the international symposium on the paper machine, was remarked upon at the opening session.

The hotel management finally got Dr. McCarthy out of his room so that he missed very little of the session.

He was in Appleton to meet Dr. Herbert F. Rance, manager of research and development and all technical departments for the 14 Wiggins Teape mills in England, which make about one-fourth of Britain's specialty papers.

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WHERE FORESTRY TOUR BEGAN

In a clearing in the Maine woods more than 50 pulp and paper executives gathered to learn about Penobscot Experimental Forest. THOMAS MC LINTOCK of the U. S. Forest Service, speaker, says project could at least treble growth of most softwoods.

APPA Maine Tour Sees Innovations

50 executives view Great Northern's new whole log digesters and newsprint machine with latest speed-up design

● Real forestry in action was seen by more than 50 pulp and paper executives during the Maine forestry tour sponsored by APPA, Sept. 16-17. For 300 years these forests have supplied the nation with an ever-increasing amount of timber, and today Maine is still the most heavily forested state in the U.S., with a brand new future opening up because of new processes in use of hardwoods and what was formerly regarded as useless or inferior wood.

For two days members of the tour saw some down-to-earth forest management which gave new dimensions to their respect for these Maine "Down-Easterners," and just when they were beginning to believe that they had seen everything, they were struck almost speechless when they saw the major expansion at Great Northern Paper Co.'s East Millinocket mill. To some who said they couldn't afford to do such things in their own areas, these State-of-Mainers bluntly replied that they couldn't afford not to do them.

A "get-acquainted" dinner was held first at the home of Mr. and Mrs. Curtis M. Hutchins. He is president of Dead River Co., and Bangor & Aroostook Railroad, and now is a new director of Scott Paper Co., as a result of the H. & W. Co. absorption by Scott.

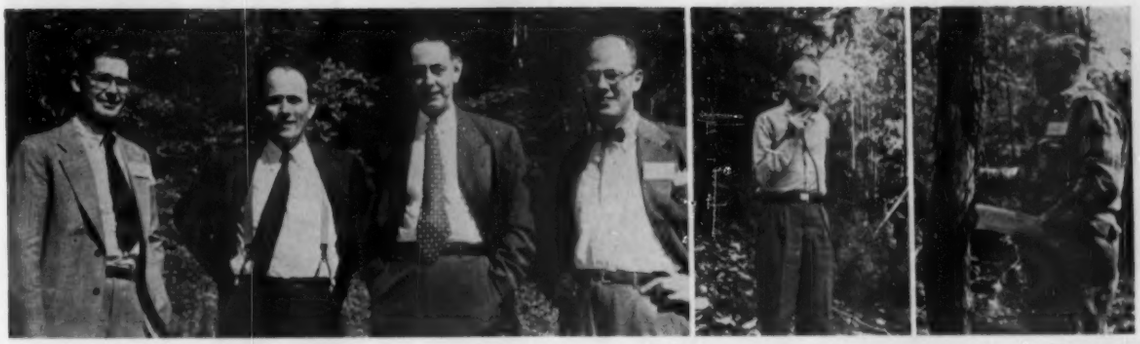
Purpose of the tour, according to E. W. Tinker, executive secretary, APPA, was to get the top policy men out into the woods to see what was being done. He added it would have been a good thing if members of Congress could have taken that trip. Mr. Tinker, an ex-forester himself, expressed surprise at the advance that forestry has made in Maine. "Ghost towns," he claimed, "as far as the pulp and paper industry are concerned, are a thing of the past. We, the U.S. and Canada, are going to supply the world with pulp and paper."

SEEING IS BELIEVING—On a crisp autumn morning, the 50 executives gathered in a clearing in the Maine woods and heard Thomas McLintock of the U.S. Forest Service tell them of progress at the government-industry cooperation Penobscot Experimental Forest. They walked with him through this forest and saw the results of selective cutting, natural regrowth in specially selected seed plots, as well as chemical debarking.

Penobscot Forest was selected after consideration of 20 locations and turned over to the Northeastern Forest Experiment Station in 1950, under a 99-year-lease for research. The forest is about eight miles northeast of Bangor, Me., covering an area about six miles long and one mile wide,

AFTER BEING BUCKED

Logs are loaded on trucks by this Schield Bantam crane. In right foreground, A. G. PAINE II, (left) Vice Pres., N. Y. & Penn. discusses operations with JAMES L. MADDEN, former Pres., Hollingsworth & Whitney Co., now a director of Scott Paper Co.



SCENES IN THE MAINE WOODS

(Left) These executives had just seen Penobscot Experimental Forest (l to r): A. G. PAINE, Vice Pres., N. Y. & Penn. Paper Co., JAMES L. MADDEN, former Pres., Hollingsworth & Whitney Co. and now Director of new owners Scott Paper Co., JOHN L. HOBSON, Pres., St. Croix Paper Co., and AMOR HOLLINGSWORTH JR., Pres., Tileston & Hollingsworth Co. Center, DWIGHT DE MERITT, Woodlands Mgr., Dead River Corp., tells APPA tour that Eastern Corp.-Dead River tree farm they are now on is largest in Maine, encompassing 101,608 acres. Right, GENE HOWIE, Chief Forestry Engineer for Fraser Paper Ltd., demonstrates chemical debarking to the group.

about 3,800 acres. Mr. McLintock said the project could at least treble in growth of most softwood lines. Profits from the logs that are sold theoretically go back to the cooperating companies, but up to now the companies have plowed them back into the project.

Two Maine Central busses later were driven along roads through the 11,000 acre tree farm of the Penobscot Development Co., subsidiary of the Penobscot Chemical Fibre Co. The executives passed over a bridge which Louis J. Freedman, vice president of the Penobscot Development, and Edward L. Giddings, chief forester, said had been rebuilt in two days, especially for the forestry tour, after having been destroyed by hurricane Edna. They saw how easily removable the bark was on trees that had been chemically treated with sodium arsenate. They viewed a 9,000 cord pulpwood operation and saw the corded piles of wood uniform in diameter, selectively cut.

After lunch at a wood camp, they drove over the roads of the Dead River-Eastern Corp. Tree Farm, largest certified tree farm in Maine, and under supervision of Dwight DeMeritt, former professor of forestry at Maine. Mr. DeMeritt guided them to a 10,000 cord pulpwood operation in full swing. Tractor and horse, side by side, yarded logs to the roadside where they were bucked into 4-ft. lengths with a power saw. A Schield Bantam crane with clamshell grapple, loaded logs into trucks for delivery to the mill.

BIG EXPANSION AT GREAT NORTHERN—These executives then saw the Great Northern Paper Co's. operations, huge pulpwood piles and a vast network of buildings which comprise the East Millinocket mill. Later, the equally large operations at Millinocket. Here they saw the culmination of a 90-mile waterway system, which extends from the Canadian border to these mills.

At East Millinocket, they saw the new woodroom, new steam plant, new screening room, new grinders being installed. They saw the 50-ton horizontal digester pilot plant for chemigroundwood about which there has been much talk, and then, in startling contrast, the new digesters which will pre-treat whole logs, barked and unbarked, prior to grinding. For plant operation, this semi-cook of whole logs is done in vertical digesters. This is first plant installation of its kind to make use of hardwood for newsprint (sulfite will be added, of course), and calculated to greatly reduce costs of this pulp.

Climax of the tour at East Millinocket was a preview of the new giant 276 in. Beloit Fourdrinier newsprint machine which was expected to start up early October. A new designed press section, faster drying and other new gadgets hold promise of eventual newsprint speeds beyond the present record of 2,000 fpm held by Powell River.

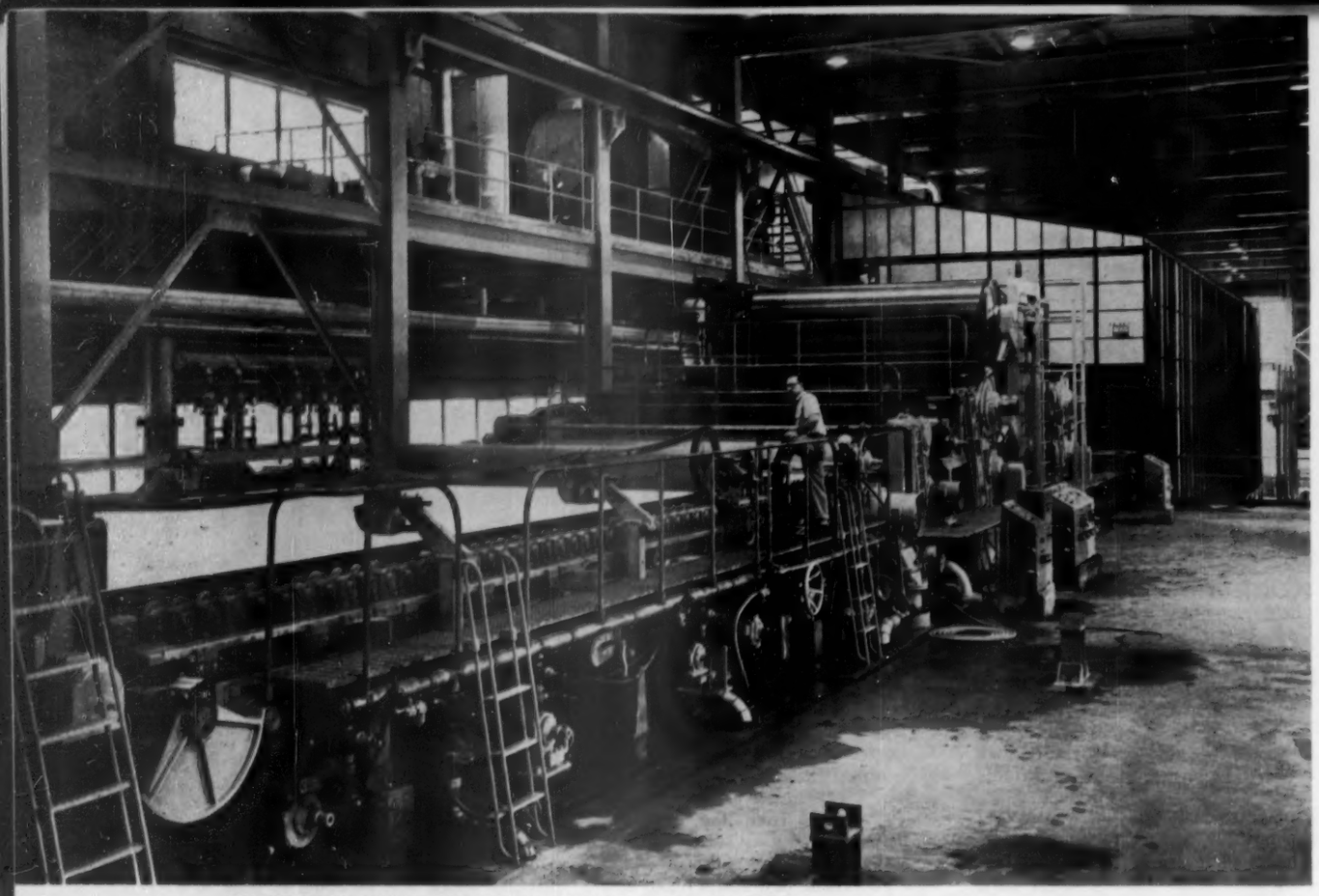
One executive told Roy V. Weldon, vice president, Engineering and Research, "I've heard a lot about Great Northern, but I had to see for myself before I could appreciate all that you are doing."

SULFITE MEN FORM NEW GROUP

NEWLY FORMED Sulfite Superintendents Group of Pacific Superintendents around table to left: J. V. SAVAGE (back to camera), Sulfite Supt., Crown Z Camas; L. A. LAFOND, Sulfite Supt., Crown Z Lebanon; D. C. CHADS, Sulfite Supt., Puget Pulp; RAY JOHNSON, Sulfite Supt., Weyerhaeuser, Everett; O. C. WHEELER, Asst. Sulfite Supt., CZ Camas; JOHN DUNKAK, Puget Pulp; E. J. ROAKE, Asst. Sulfite Supt., CZ West Linn; C. J. CLOPPER, Sulfite Supt., Inland Empire Paper; GEORGE R. K. MOOREHEAD, Sulfite Supt., Oregon Pulp & Paper; Chairman TOM H. GRANT, Sulfite Supt., Publishers' Paper. MARION HAYS, assistant to Mr. Grant, wasn't present for picture.

Sulfite Supts. Form New Group

Problems and techniques of particular concern to sulfite pulp mill supervisors are to get special consideration in a newly formed Sulfite Superintendents Group on the Pacific Coast. After the meeting the group visited local mills and had dinner that evening at the home of Carl E. Braun, Publishers' vice president and mill manager. A group forum discussed processes, maintenance and production.



AN ENTIRELY NEW CONCEPT ELIMINATES FIBER BUNDLES

This Rice Barton Fourdrinier and dryer forms pulp at Rayomer's new Jesup mill. Carries 175 in. wide wire, 95 ft. long. Headbox and slice arrangement is new to eliminate fiber bundles. Entire wet end is raised on mezzanine to eliminate congestion at operating level. Ross Engineering-hooded dryer section is on lower level.

Rayonier Fills Out A Winning Hand

New "ace" is most versatile of five mills, utilizing ingenious materials handling and conveying systems

This is PULP & PAPER's own exclusively-prepared story of Rayonier's newest of five mills, its highly flexible, specialty cellulose mill at Jesup, Ga. Visits by PULP & PAPER editors to this mill, both before and after its start-up, made possible this first-hand, specially prepared and thorough report on one of the most modern new mills in this industry.

• The South can be mighty proud of the ruggedly handsome red-brick industrial establishment which Rayonier Inc. has created for $25,000,000 on farming plains of Southeast Georgia.

In this great industry—and in any other American industry, for that matter—this Jesup, Ga., chemical cellulose plant stands forth as a paragon of engineering excellence and wise over-all industrial planning.

Capable of making highest qualities of the specialty Rayonier cellulose brands, and any of the half dozen types of pulps made by the other four Rayonier mills, the new mill is designed to comfortably produce a minimum of 275 tons every 24 hrs. of purified wood cellulose. Its products will be shipped to many acetate, viscose, cellophane or paper markets of the United States and abroad.

This could well be called a "mill of the future" but it is here now. It looks entirely unlike the standard pulp mills of the past, and more like an ultra-modern chemical industry. And that's exactly what it is.

There's a modernistic red brick office with pine panelling, fluorescent lighting, air conditioning, etc. The aqua-hued continuous fenestration running the entire length of all plant divisions gives uninterrupted lighting through infra-red-ray heat resistant glass. The acoustical-quality green cinder block interior gives class to personnel-safety offices, locker and shower rooms and labs. And that final artistic fillip—an architectural-designed finishing room and wall of almost all glass, at the very end of the entire process—is a proud feature.

But before getting into a discussion of the physical plant, which has so many new and unique features—there are some significant things that have been done on the higher and broader levels of company management and community relations.

HOW JESUP'S DESTINY CHANGED—This mill is in the country that General Sherman marched through 90 years ago.

A PULP & PAPER editor's automobile almost ran over a wild boar and several assorted cattle, which probably were direct descendants of commandeered cattle that fed the Sherman army. At any rate, the City

*** Rayonier's new symbol, adopted to identify products and properties, was designed by company's artist Ariosto Nardozzi. Advantages of the new symbol are high visibility, unusual and distinct appearance, flexibility in application.**

of Jesup, at the corner of a triangle 66 miles southwest of Savannah and 41 miles northwest of Brunswick, has been almost a 100% agricultural community since Sherman's March to the Sea.

Modern industry's invasion of the South had not touched it until three years ago, when the management of Rayonier decided this was the ideal site for their No. 5 mill. Up to that very moment, folks around Jesup had figured their destiny was in becoming a great cattle country; in fact they were having a cattle show the day PULP & PAPER paid a visit.

Rayonier chose this site for its No. 5 mill and first above tidewater because it was in one of the few not-too-competitive industrial and wood areas in the South. Here were:

(1) Plenty of gum and pine;

(2) A large labor pool from which it drew 450 employees;

(3) Two major railroads (Rayonier built its own spurs to the Atlantic Coast line ½ mi. to the east, and the Southern R.R. 4½ mi. to the west);

(4) Plenty of well water and a fast flowing river (the Altamaha has a greater flow than the Hudson);

(5) Excellent foundation conditions and subsoil, and—not least of all—

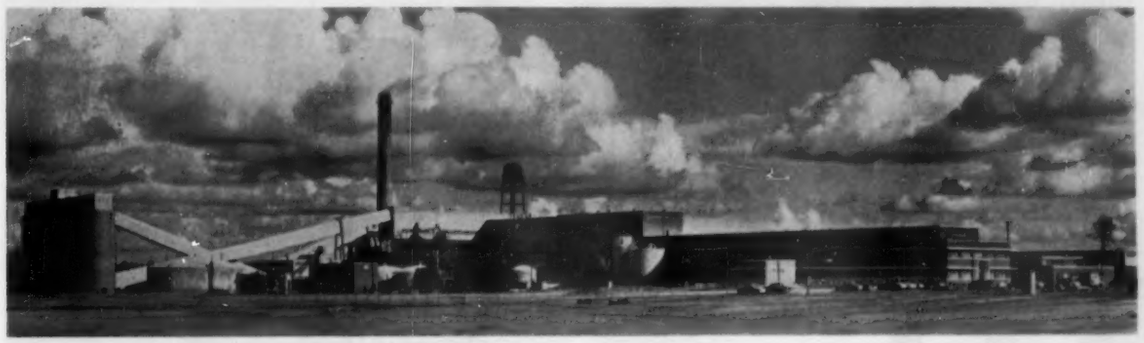
(6) A favorable attitude toward industry among Jesup's 4,600 population (on eve of mill startup in May it had grown to 5,800).

The Jesup service organizations went all-out for the new mill. They appreciated the frankness of Rayonier executives who told them beforehand that the mill would not only smell—"it would stink"—and promised to be patient and cooperate while Rayonier and other industry scientists sought further means of abating odor.

Rayonier asked for no tax or other concessions, and none were received. In fact, when the mill started up in May, Rayonier had already paid out $400,000 in state sales taxes at 3% before earning a dollar.

Rayonier has promised to hold off building any homes or apartments for employees as long—but only as long—as independent builders' prices remain fair. There was some serious question about housing and rental costs as the mill got going. Rayonier's hourly workers will average $3,600 straight time pay annually, which is more than twice the average Jesup family income in 1950.

Rayonier management is anxious to build up the school scientific curricula and as a large taxpayer will share a part of the cost of enlarging the school system to take care of about 900 additional school children. As far as is known, chemistry has never been taught here, but now the civic leaders have promised Rayonier that it will.



ENGINEERING PRINCIPLE HERE—A STRAIGHT LINE OPERATION

Here is a general view of Rayonier's 5th and newest mill. Georgia's soft clouds and skies make for interesting background in land that has its first real industry in a farm area since the exciting days when General Sherman marched to the sea.

New Construction Techniques And Materials Handling Ideas

● The Jesup Division of Rayonier consists of a 93 acre area inside a cyclone fence, and it owns a total of 500 acres surrounding the mill, all about 100 ft. above sea level. Already its Timber Department has planted a large "demonstration" plot, which it will be sure reveals the best scientific tree growing.

But trucks will haul wood up to 60 miles to this new mill, and because of freakish railroad rate structures, it will be cheaper in some instances to bring Florida wood to Jesup and to ship wood from Jesup's own "backyard" to Rayonier's Florida mill by rail. By way of a winding highway skirting Georgia's extensive tidewaters, it is just about 100 miles between the two mills.

Construction of 4½ mi. of railroad on the plant grounds speeded up materials handling during construction and these railroad spurs run right into various mill buildings and are now an unusual aid to materials and equipment handling in the mill.

For instance, one spur runs into a high hatchway between the pulp wash room and multi-stage bleach plant and a 2-hook crane at the top of the hatchway can quickly lift and load the Impco washer cylinders and other heavy equipment, directly from railroad cars to either plant—bleaching or washing. Other tracks run into the digester building, machine room and finishing.

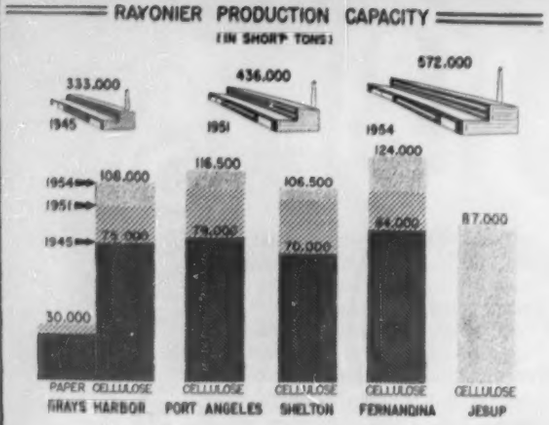
There are five Ederer (Seattle) overhead cranes in the machine and finishing rooms.

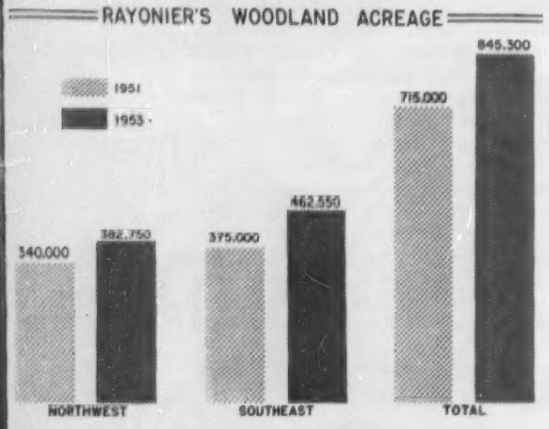
Several Northwest Engineering motorized cranes and two Wright overhead cranes are in use. An American Hoist diesel r.r. crane and P&H crawler crane operate in woodyard. Slings are used to unload whole trucks in one swoop. A fast-water flume makes for fast movement of wood to mill. Almost everything conceivable is covered by crane handling.

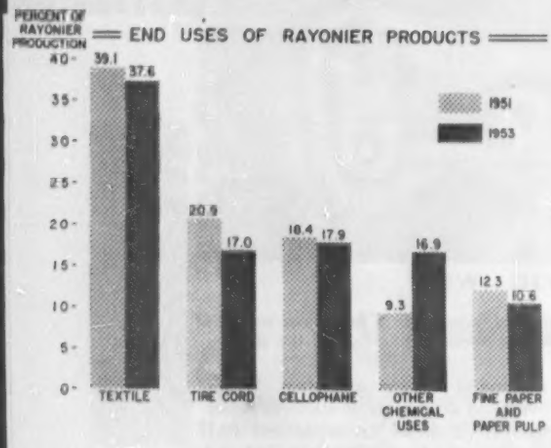
QUICK CHANGE FOR DIGESTERS—A hoisting apparatus is rigged for easy, quick removal of the unhoused digesters. There is adequate space and framework to make possible changing a digester in 6 hours, except for the piping.

A new high speed construction technique was use of a big Vibroflotation machine developed by Sergey, Stuerman, New York, for creating the needed soil density for structures. The vibrator compacts the soil while an ammeter indicates when it reaches right density, and penetrations were made to 22 ft.

Over 21,000 yards of concrete,







3,000 tons of structural steel, 1,000 tons of plate steel and a great deal of stainless steel were used in the construction of this mill.

But it is hard to find a single piece of wood in this entire plant—so much so that Resident Mgr. Stein had a hard time getting authorization for a carpenter's shop, as he certainly didn't need it for mill structures.

HOW IT MAY EXPAND—The way in which construction allows for future expansion is interesting. This is the first Rayonier mill not built in a compact square. It is a straight line flow from power, recovery, liquor make-up and digesters, through washing, bleaching to machine room and the line there swings to one side through a transfer room to the big finishing department.

The wood preparation area is off in an open area to one side of the digesters, and here is plenty of room to expand on each side of the drum and hydraulic barkers. Then expansion is possible on each side of the chipping plant, and either side of the chip storage bins. From here on the straight flow of the rest of the process a lows for duplication of installations all the way through. There are all Transite or temporary concrete block walls on one side of every building, to allow for this expansion.

Many of the exterior tanks here have the Erkote corrosion resistant paint treatment provided by Earl Paint Co., Utica, N.Y.

MAJOR CONTRACTORS—Over 40 contractors on the job speeded up the work. Ebasco Services, Inc. of New York, under the direction of Rayonier engineers, served as general design engineers and supervisors of construction. Eichleay Corp. of Pittsburgh did all heavy equipment erection. Rowland Tompkins & Son performed exceptionally in getting in all piping in plenty of time for every unit, and did much pipe fabrication on the site.

All tile for bleach plant and washroom, the big chip storage bins 90 ft. high, storage tanks, etc., were all done by Stebbins Engineering & Mfg. Co. A new Saran rubber type of lining was also introduced by Stebbins for special service.

Preload Central Corp. built a new type of "egg-shell" pre-stressed lightweight circular tanks, gunnited inside and outside with pre-stressed wiring. These are light weight, cheaper than steel, and non-corrosive and several such tanks were built at the mill. One is 92 ft. by 24 ft. and two are 70 ft. in diameter and 24 ft. high.

Johns-Manville Transite walls are on one face of many buildings to allow expansion and Transite covers all conveyors, supported on simple, sturdy, steel framing painted light grey. The color dynamics in this mill are interesting and varied. There is Johns-Manville Thermobestos insulation for pipes, Foamglas insulation for pressure vessels, tanks and boiler breeching.

A great amount of the stainless steel fabrication was by Rives Co. of Jacksonville. Fabrivalves built by Greenville Steel & Foundry Co. were used generally in the pulp mill. Other valves were mostly Walworth and Esco with Paul stainless steel ball hydraulically controlled digester blow valves.

General steel fabrication and erection was by Bristol (Tenn.) Steel and Iron Works. Atlantic Steel Erectors furnished pre-formed reinforcing steel.

Layne Atlantic Co. built four 1,000 foot wells, one a standby, which supply mill operations with 24,000 gals. per day and Infilco and Cochrane provided the special water treatment facilities. Infilco provided settling equipment and Cochrane a series of water softeners.

RAYONIER OFFICERS

(Left) CLYDE B. MORGAN, President of Rayonier Inc., and JAMES T. SHEEHY (right), Executive Vice Pres.

Vice Presidents WILLIAM E. BREITENBACH (left) and RUSSELL F. ERICKSON (right)

Vice Presidents ARTHUR N. PARRETT (left) and RUSSELL M. PICKENS.

GRAPHIC PANEL FOR ClO_2—Instrumentation generally throughout the mill is by Foxboro except for boiler plant instrumentation by Bailey. There is one graphic panel for the Solvay chlorine dioxide stage in bleaching. Wide use is made of the new Panalarms of Panellit Co. which warn of any interruption in processes.

Motors generally throughout are Allis-Chalmers and Westinghouse. Pumps by Bingham, Worthington and Ingersoll-Rand were used. Reliance Electric and Engineering Co. supplied variable speed DC drives.

A NEW IDEA HERE FOR QUICK WOOD UNLOADING—LEADS DIRECT TO THREE BARKERS

Link-Belt Co. built this unusual unloading station proposed by Rayonier engineers consisting of mast and winch which throws a cable loop around a truckload of wood and unloads the entire truck in one movement over a buttress and into the flume. This makes for speedy movement of wood up this Link-Belt conveyor to either of 2 big FMP drum barkers or Hansel hydraulic barker. Each drum barker is in 3 sections, 67½ ft. long. Two r.r. spurs can be seen alongside the 1,000 ft.-long flume.

What's New In Handling And Preparation of Wood

● In stressing the ingenious materials handling and conveying system which make Rayonier's Jesup operation an outstanding new mill, it is natural to start in the woodyard.

The impressive point about the wood handling is its simplicity, compactness. There is a minimum of wood movement.

Four separate railroad spurs branch into the yard in parallel from one line and two are on each side of an 1100 ft. concrete high velocity flume. On each side one spur follows closely alongside the flume and the other tracks, on each side, are farther out for feeding wood stacks.

Both rail and truck wood are unloaded into the flume, which flows at 7 feet per sec., fairly fast, because the pine and dense hardwoods tend to sink.

Rayonier designed, and Link-Belt built, an unloading station for truck wood which consists of a mast and winch which throws a cable loop around a truck load of wood, and pulls the wood off the truck over a buttress into the flume. A 40-ton American Hoist diesel electric r.r. crane and 1¾ yd. Harnischfeger crawler crane work in the yard and they are used for r.r. car unloading and stacking. Blaw-Knox grapples are used to stack in yard. Also a sling is designed to lift a whole truck load into the fast-moving flume.

The haulup conveyor at the end of the concrete flume is split, carrying wood to either of two Fibre Making Processes drum barkers or to the Hansel hydraulic pulpwood barker. Either one of two FMP barkers can be served, each being a large three section barker, 12 ft. diameter by 67½ ft. long.

The Hansel hydraulic barker takes gum and the FMP drum barkers, pine. The former is fed one log at a time on conveyor and it has four knife-type water jets with pressures at 1550 psi, striking the log from top, bottom and both sides.

Two shifts of wood room operation are serving the mill sufficient wood for 24-hr. operations.

Jeffrey Mfg. Co. provided a compact sorting shed according to Rayonier plans where barked wood is culled, oversize wood being taken to a splitter. Rejected wood is either recycled back to drum barkers or to Sumner Iron Works hogs. Rayonier wood requirements are more strict than usual.

A D. J. Murray motor-driven splitter takes up to 40 in. diameter wood and splits it to size for the chippers, while discarded wood goes to the two Sumner hogs, then bark storage and to a boiler. This sorting deck has a 6 ft. wide B. F. Goodrich Super-long-life rayon cord conveyor where sorting is done, with only two workers required. The conveyor is 120 ft. long.

Two 16,000 gpm Bingham pumps recirculate water back into the flume, after a bar screen scraper, followed by a Link-Belt water screen which removes bark and debris. Bar screen and fine screen discharge to the bark conveyor and sand is settled out into a low velocity concrete tank.

Here is where some of the many Dempster Dumpsters are useful. They are used on the mill grounds for trash pickup. These Tennessee-built units are useful here in taking away the sand.

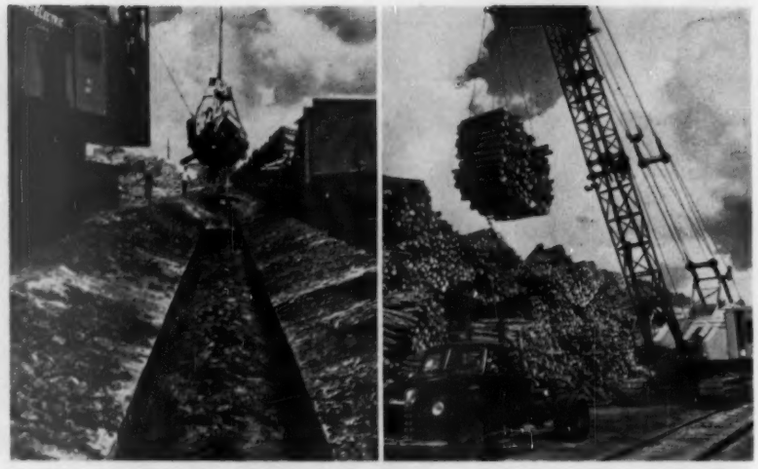
Another one of the strategically placed r.r. tracks on mill grounds is for unloading of liquid sulfur dioxide, chlorine and caustic soda tank cars. A Fuller Co. Airveyor provides pneumatic unloading of salt cake.

Jeffrey conveyors lead to and from the D. J. Murray 110 in. 10 knife chipper. A spare chipper is an exact duplicate, enabling maintenance and repair work without stoppage of the operation. Chippers are driven by 1,000 hp, 300 rpm Westinghouse synchronous motors. Chips are conveyed through three Allis-Chalmers low-head vibrating screens by Falk distribution conveyors and rejects go to a small Murray re-chipper.

TELEVISION ENTERS FIELD—One of the unusual features at this mill is an industrial television camera at the top of the 6 chip silos, which are 90 ft. high, and so nobody has to be at the top of the silos to watch and control the operation. The camera is on the belt unloader and the operator remains at ground level with his TV screen.

The TV installation is called a Utiliscope industrial type TV made by Diamond Power Specialty Co. Two Merrick Weightometers are also positioned at ground level instead of the conventional position on the top of the bins. The camera shows when the bins are loaded and reveals the entire operation at top of bins. The bins are 30 ft. diameter made of Stebbins Semtile with steel hoppers and vibrating Jeffrey dischargers at the bottom of each one.

Rayonier can classify its wood six ways, having six silos, and therefore can blend wood in any one of six proportions of species or age desired, and can run out any blend desired at any particular time.



EQUIPPED FOR RAPID WOOD HANDLING

(Left) American Hoist & Derrick Co.'s 40-ton diesel electric with Blaw-Knox grapple unloads r.r. wood into 1000-ft. long concrete flume. This raceway leads directly to either of 2 Fibre Making drum barkers or Hansel hydraulic barker. Water is circulated by two 16,000 gpm Bingham pumps. (Right) Truck wood is unloaded by Harnischfeger (P&H) diesel crawler—entire load handled by fast-action sling in one movement. Up to 20,000 cords can be stored in woodyard.

In Direct Line Are Recovery, Power, Cooking and Bleaching

• The power-recovery installations lead off in a direct line of cooking and pulp preparation and drying and finishing procedures, and these are compactly, efficiently positioned.

There are two 650 psig Combustion Engineering 100,000 pph steam capacity recovery boilers. The evaporator is a sextuple effect by General American (now Chicago Bridge). There is one Babcock & Wilcox bark and oil burning boiler of 135,000 lbs. capacity. Oil is burned only as needed. This has a traveling grate for bark.

D. J. Murray cascade evaporators are used for concentrating liquor in recovery. Black liquor pumps are Worthington and boiler feed pumps, three of them are Ingersoll-Rand.

Research Corp. provided two wet bottom type precipitators instead of the more common dry system, using shakers to carry solids to bottom. Each unit will recover sodium carbonate from 110,000 cfm of gases at 300° F. at a specified collector efficiency of 90.5%.

Important in the air pollution battle here is 250-ft. high brick-lined concrete chimney or stack by M. W. Kellogg Co., built with movable steel forms moved upward as work progressed with scaffolding supported by cables from two-day-old concrete. Rayonier made extensive studies on air currents in deciding on height of the chimney.

Allis-Chalmers supplied switchgear and control panels for the two Westinghouse 5000 kw, 6250 kva, 3600 rpm steam turbines. One is an extraction condensing unit, inlet steam, 625 psig, 750° F., and the other a back pressure unit with 60 lbs. exhaust pressure.

Dorr Co. provided a special causticizing installation for this mill and the lime kiln is a modern long type Allis-Chalmers kiln, 11 ft. diameter and 180 ft. long.

MAY LEARN ABOUT DIGESTERS—Rayonier may perform a critical service to this industry in its decision to install three somewhat differently equipped and constructed digesters for the purpose of finding out the possible answers to the baffling corrosion problems in digesters.

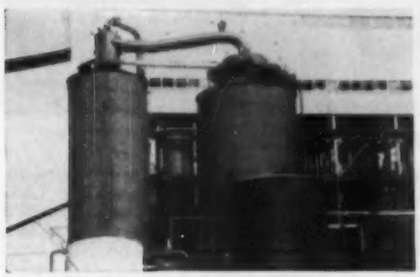
Four of the 5000 cu. ft. digesters installed at Jesup are stainless steel "Smith-Lined" with Type 316 ELC stainless steel. Two others by A. O. Smith Corp. are Lukens stainless clad

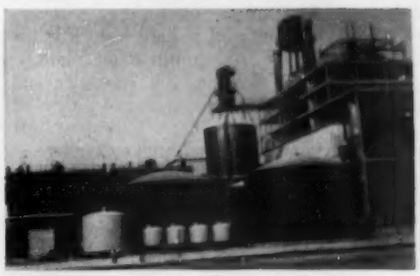
FIVE MANAGERS OF RAYONIER MILLS

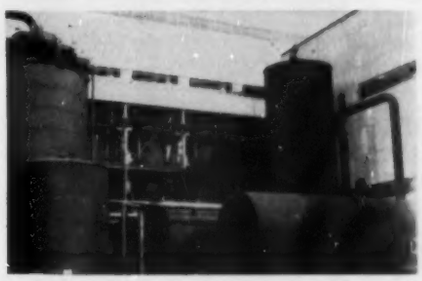
Here are the men who manage the mills of Rayonier, from left: GEORGE CROPPER, Shelton, Wash.; HARRY THURLOW JR., Port Angeles, Wash.; GEORGE A. HOLT, Hoquiam, Wash.; FRED DOHERTY, Fernandina, Fla.—and the new member of the "club"—TOM STEIN at Jesup, Ga.

New Rayonier Mill uses ERKOTE® Mastics

to protect these steel structures







At this modern new chemical cellulose mill of Rayonier Incorporated, at Jesup, Georgia, ERKOTE 2X Corrosion Resisting Mastic and ERKOTE 3X Insulating Mastic were selected to protect vital operating equipment. The tankage illustrated at the left is only part of the equipment coated with this long-lasting, maintenance-free surface protection that guards against moisture, vapors, heat and corrosive action.

Convincing proof of performance in dozens of different industries!

In pulp and paper mills, in refineries, in every industry where insulation and surface protection are a problem, you will find Erkote Mastics combating fumes and acids and other corrosive elements . . . with completely satisfactory results under the most severe conditions. They are applied in one seamless application that bonds to practically any surface, and they are not affected by weather or thermal changes.

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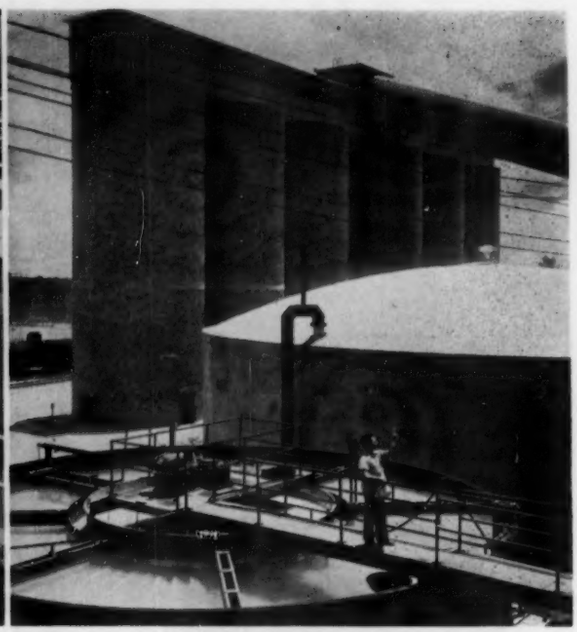
RAYONIER CHIPS ARE SCREENED HERE

Through these three Allis-Chalmers Mfg. Co. 5x16 ft. "Lo-Hed" vibrating screens must pass the chips before acceptance by the cellulose mill of Rayonier in Georgia. Rejects go to a Murco chipper and then are re-screened. Murco also built 2-110 in. 10 knife chippers.



EXTERIOR INSTALLATIONS

Infilco built this accelerator for water chemical pre-treatment. In background are 90 ft. high Stebbins Semtile chip silos; Link-Belt conveyor takes chips to top, where wood can be classified 6 ways. Diamond Power Specialty industrial TV at top of bins lets operator stay at ground level.

steel-lined. Then there are two other digesters fabricated by Chicago Bridge & Iron with Lukens cladding used. Each digester is 12 ft. in diameter and 55 ft. high.

Only the operating floor of the digester house is enclosed as weather is mild—6 degrees above zero is lowest record at Jesup. Circulating pumps are by Bingham with Allis-Chalmers drives and Electric Steel Foundry provided the circulation systems and special motorized valves.

Many essential auxiliary mill supplies in this mill were provided by Holley-Edwards & Co., Jacksonville, Fla.

BROWN STOCK WASHING—The pulp is blown from the digesters into a 26 ft. dia. blow tank from which the stock is pumped to the counter-current brown stock washing system consisting of three 9 ft. 6 in. by 16 ft. Impco washers. All vapors released during the blow period are recovered in a Fibre Making Processes blow heat recovery system which provides hot water to the entire mill. High density stock from the final washer passes to a large Semtile storage tank which holds the stock before it moves on the screen.

This tank provides ample reserve capacity to assure operating continuity as well as flexibility for changes in pulp grades. From this tank pulp passes through a special dilution system to six Vibrotor screens supplied by Bird Machine Co. Overflow stock then goes to Impco secondary and tertiary flat screens. The screened unbleached pulp next passes through six 12 in. Dirtecs made by Bird Machine Co. The Dirtec units discharge directly into a 9½ x 14 ft. tile vat which serves as a rewasher.

Washed pulp from the rewasher then goes through a DeZurik consistency regulator into a 36 by 34 ft. high Semtile pulp blending tank, erected by Stebbins Engineering Co. The stock tank serves both for storage and blending. A high rate of blending is obtained with three vertical agitators supplied by James Brinkley Co. of Seattle.

Washed and screened stock is then bleached in a multi-stage plant especially designed by Rayonier engineers. This is a significant development of Rayonier Research for producing new high qualities of chemical cellulose.

A second high-density storage tank receives the bleached stock. This bleached stock is then diluted with water through a special ratio-controlled system and pumped to three Bird Vibrotor screens before going into the blending tank ahead of the pulp drying machine.

Pulp Drying and Finishing Have New and Unusual Features

● The Rice Barton pulp dryer for Rayonier's newest mill has a Fourdrinier which carries a 175 in. wide wire. Six large 12 in. Bird Dirtecs clean pulp ahead of the machine. Machine chest agitators are from James Brinkley Co. A new type stock inlet and headbox is all stainless and other parts of the Fourdrinier touched by stock are stainless clad. The removable type Fourdrinier is placed on a mezzanine floor as there is no basement. It is unusual in this raised position in relation to dryers.

Ross Engineering provided hood and ventilating system. The dryer rolls are 48 in. diameter by 175 in. wide and rotate on Torrington roller bearings. Fawick Airflex clutches are used. Press rolls were rubber-covered by Stowe-Woodward. Vacuum pumps are Nash Hytor. Midwest Fulton's condensate system is used. The machine drive and controls are Rice Barton and Westinghouse. A special new type moisture-recorder controller is by Foxboro.

There are 98 dryers in all. Virtually all are in stacks of ten, with 5 nested on each side of the stack. The pulp

is wound into 12 ton jumbo-rolls on a Rice Barton double drum reel and transported by cable-car, with cable in a floor-track, to two large roll storage areas, each equipped with a crane.

The emphasis on efficient, automatic and pushbutton materials handling is again seen at the finishing end.

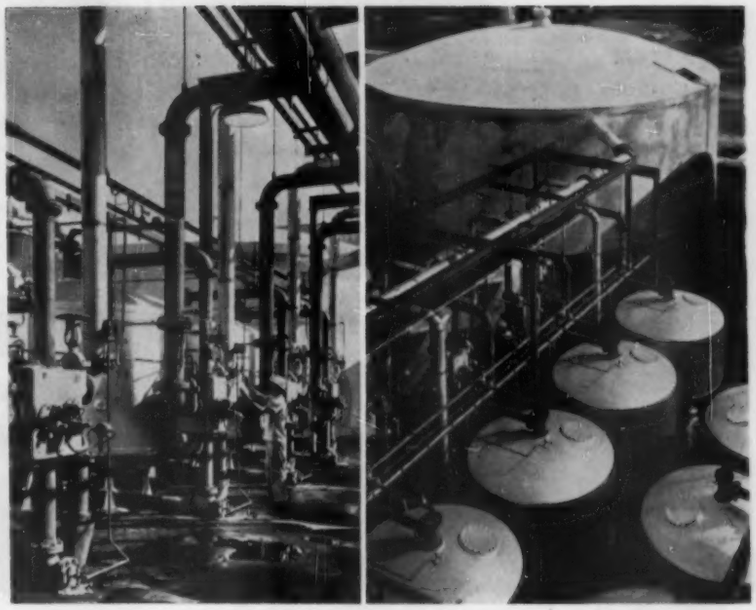
Following complete chemical and physical tests by the mill technical department, each jumbo roll is transported again by crane and roll car to either the sheet finishing section or the roll finishing section to suit the customers' requirements.

Sheet finishing which results in baled pulp sheets is performed on a 166 in. Lambs-Grays Harbor cutter and layboy which can operate at speeds up to 500 ft. per min. Stacks of pulp cut to customer sizes are ejected automatically from the layboy to an intricate automatic conveyor system which transports the bales to either of two scales where each bale is pre-weighed.

Another automatic ejector and conveyor deposits the bales into two 1000-ton Washington Iron Works baling presses, which then discharge the compressed bales to special air float type tying tables. Wrapped bales are then conveyed by a special Mathews conveyor to the car loading platform.

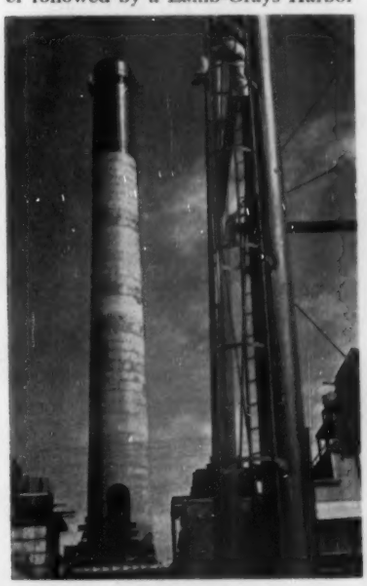
Roll finishing equipment consists of a 166 in. Langston Slitter-Rewinder followed by a Lamb-Grays Harbor roll wrapping system which deposits wrapped and weighed rolls to the car loading platform.

The finishing room is a vast area with five acres of storage and two complete 20 ft. bays for bulk roll storage. The big rolls can be stacked three high if necessary, but are generally stacked two high. Five Baker electric lift trucks are used in the finishing end. There are two parallel railroad tracks into the finishing end, with room for ten r.r. cars on the two tracks, all under cover.



WATER GETS SPECIAL TREATMENT AT JESUP

(Left) Section of giant water purification system which is so important in making high quality chemical cellulose at Rayonier's Jesup, Ga., mill. Some 20 million gals. a day of water is pumped from 4 Layne-Atlantic 1,000 ft. wells. Water is scientifically treated to exact specifications. Cochrane Corp. supplied 11 automatic water softeners, some shown here.
(Right) Beyond Cochrane water softeners in foreground is one of new type "egg-shell" pre-stressed lightweight circular tanks by Preload Central Corp. Gunnited inside and outside with pre-stressed wiring, these are cheap, light in weight and non-corrosive. Earl Paint Co. provided the corrosion-resistant Erkote coating for the tank, a protective covering used in many Southern installations.



WAY UP IN THE AIR— REDUCING AIR POLLUTION

All gases from Combustion Engineering boilers at Rayonier's Jesup Mill go up this 16 by 250 ft. high concrete, acid-resistant lined stack by M. W. Kellogg Co., but only after processing to reduce losses. Stack was carefully engineered for prevailing air currents and winds.

How Rayonier Disposes of Waste

• How Rayonier has handled its waste liquor problem in Georgia is interesting. In the first place, it uses 18 million gals. of pure well water per day. The Altamaha River carries a lot of reddish clay and it has a very fast flow. In fact, it is said to have a greater flow than the Hudson.

Minimum average flow for 7-day period is 1,615,000,000 per day (2440 cfs). Average flow throughout year is 12,500 cfs. Maximium flow on record is 300,000 cfs.

All the mill sewer pipes lead to a 42-acre lagoon with earth dykes which are 10 ft. deep and can hold about 150 million gals. It has control gates at the outlet end but normally there is no intention of holding the waste as it is well diluted and the river is seldom so low that it would be necessary. It can be held when desired.

There is also a 40 ft. diameter dump tank with 225,000 gals. capacity for emergency use. It is equal in size to the largest of any of the operations tanks—that is, the green liquor clarifier tank and the white liquor clarifier tank which are both in the Dorr system.

This dump tank is cross-piped from the blow pits and all other chemical tanks, so that if any leaks develop, or other sudden loss of black liquor or chemicals occur, this loss can be salvaged in this dump tank and kept from the river.

One of the fortunate facts about Rayonier's selection of Jesup is that it is on a river which is not carrying any load of wastes. The Ocmulgee and Oconee Rivers converge some distances northwest and form the Altamaha. But on all these rivers, the only sizable town is Macon on the Ocmulgee. And except at Macon, there are no industries of any importance dumping in the river.

SOME OF JESUP STAFF

From left, GEO. E. SCOFIELD, Asst. Res. Mgr.; CHARLES E. ROTH, Mill Supt., WM. C. RINDSLAND, Res. Engr.; JOHN F. HOOPER, Chief Chemist.; W. T. McDANIEL, Ind. Rel. Mgr.

From left, A. G. McARTHUR, Southeast Timber Div. Mgr.; J. B. TALBIRD, Asst. Controller; W. P. JOYNER, Office Mgr.; A. L. FORD, Personnel Mgr.; CHRISTINE TAYLOR, Secy to Mgr.

Planners and Builders of New Industry in South

Principal Rayonier personalities in three years of planning and creating a new chemical cellulose industry at Jesup, Ga.:

Clyde B. Morgan, president since 1951, long in its top management.

James T. Sheehy, executive vice president and former manager of Grays Harbor Division and former chief engineer of the company.

William E. Breitenbach, vice president for manufacturing and former manager of Port Angeles.

Russell F. Erickson, vice president for development and engineering in direct charge of the engineering and construction of the new mill and former manager of Fernandina.

Dr. Arthur N. Parrett, vice president and creative head of Rayonier's chemical research and development.

Dr. Russell M. Pickens, vice president for sales and for many years close collaborator with Dr. Parrett in chemical developments.

Thomas R. Stein, resident manager through construction and now for operations. A former Minnesota university and industry colleague of Mr. Erickson.

George E. Scofield, assistant resident manager; Charles E. Roth, mill superintendent and his assistant, Lowell McGinnis; William C. Rindsland, resident engineer, and his assistant, Ralph V. Zepp; John F. Hooper, chief chemist; and George E. Van Goethem, bleach plant superintendent—these, too, had engineering and technical roles during planning and construction. All came from other Rayonier mills except Mr. Roth from Riegel Paper Corp. and Mr. Zepp, from M & O Paper Co.

Likewise having special duties were Warren Flenniken, power superintendent; Roy Reynolds, chief electrician; Otha F. Powell, millwright-shop foreman, and Karl Allen, project engineer.

W. T. McDaniel, former secretary to Georgia's Senator Walter George, now heads all Southeast Rayonier industrial relations in a Jesup office, while A. G. McArthur, at Fernandina, Fla., is Southeast Timber Division manager for all Rayonier woodland operations in the area.

J. B. Talbird, assistant controller; E. J. Johnson, purchasing agent; W. P. Joyner, office manager; A. L. Ford, personnel manager; and J. A. Wilson, safety supervisor, are others locally who helped in the Jesup enterprise.

IN THESE PORTALS, NEW PLANS ARE MADE

RES. MGR. THOMAS R. STEIN (middle), enjoys showing new mill to visitors from Rayonier's Chrysler East Bdg. offices in New York: MICHAEL A. BROWN (left), Manager of Sales, and ROBERT PLUMMER, from Main Office staff.

Rayonier Pioneered In Two Other Mills

Rayonier has pioneered again in new chemical cellulose manufacturing processes, using Southern gum and pine, in its latest mill addition at Jesup, Ga.

Twice before it has similarly pioneered in this field, in both cases utilizing wood species which up to then been considered unsuitable for high quality pulp.

It made the first dissolving pulp from Western hemlock at the first market pulp mill built in western U.S. This was at Shelton, Wash. Hemlock had been considered a weed tree, of little value even for lumber, at that time. This was the foundation of a Pacific Northwest market pulp industry serving over one-fourth the purchased pulp needs of all the paper mills in America.

Next, at Fernandina, Fla., Rayonier pioneered a new process. The story of the process and the new mill was told exclusively in Feb. 1940 issue of PULP & PAPER. They were described as "daring" ventures of their day. Now a different process, allowing for greater recoveries and conservation of materials, is used.

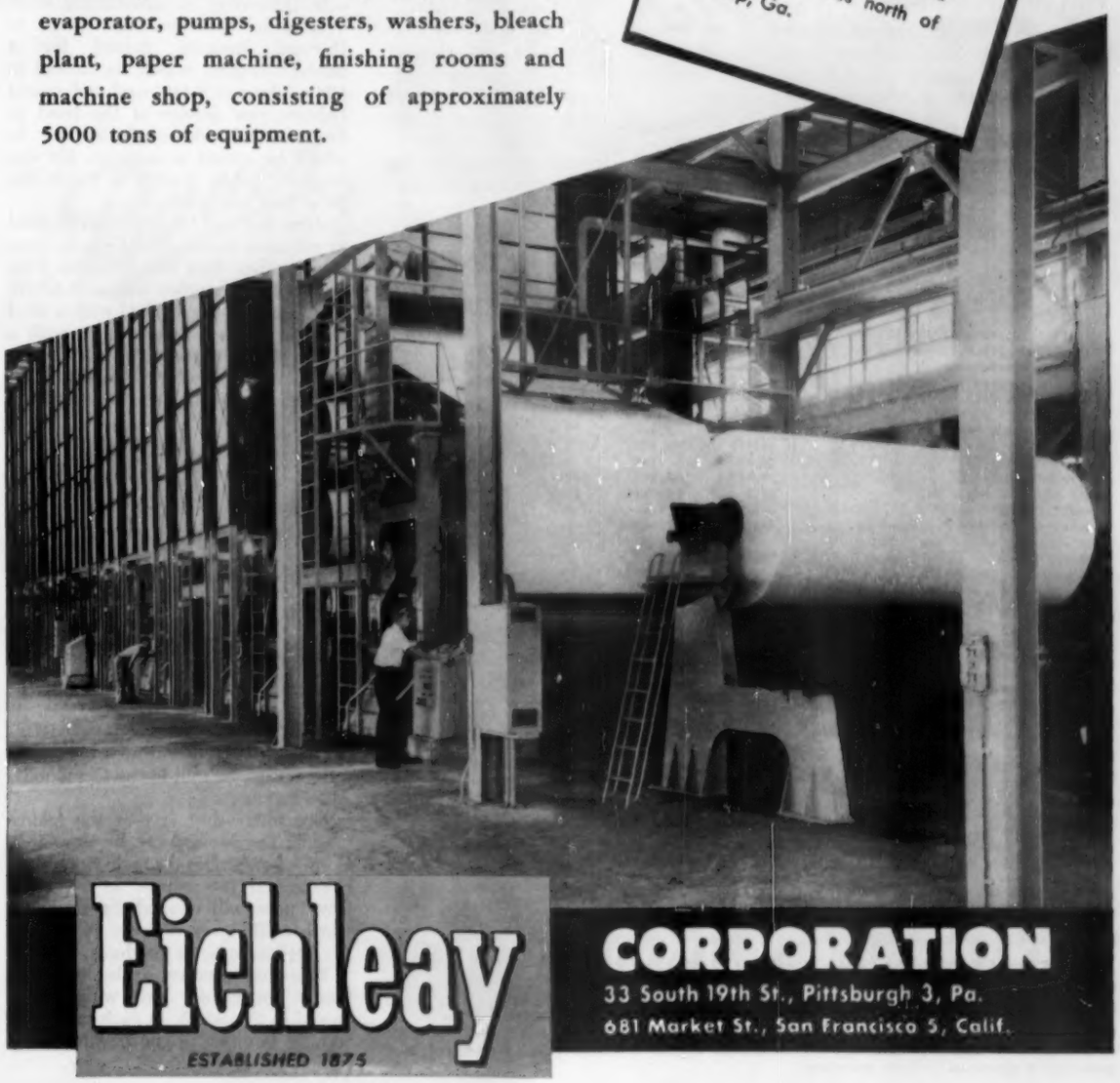
AN *Eichleay* INSTALLATION

Our work in connection with the erection of the massive chemical cellulose plant of Rayonier Incorporated, at Jesup, Ga., included the installation of equipment for the water heating plant, wood preparation, causticising and lime reburning, turbine room precipitators and evaporator, pumps, digesters, washers, bleach plant, paper machine, finishing rooms and machine shop, consisting of approximately 5000 tons of equipment.

Dry End of Pulp Machine

Here a jumbo roll of chemical cellulose is seen being formed during final stages of production.

This new plant of Rayonier Incorporated is located on a 538 acre site along the banks of the Altamaha River 4½ miles north of Jesup, Ga.



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Paper Week Held in Southern California

An editorial published in PULP & PAPER favoring a national Paper Week has found expression, at least, in Southern California.

The Paper Mill Men's Club of Southern California, through its president, J. C. Fischer of Sherman Paper Products, selected a queen for a Paper and Paper Products Week, Oct. 4 to 9, and persuaded the Mayor of Los Angeles to issue a proclamation.

At its 19th Annual Hi-Jinks, the club on Oct. 1, at Glendale, played host to paper jobbers. Anitra Stevens, Queen of Paper and Products Week, assisted the Mill Men in greeting their guests.

Bert Lewis Dies, Was Nicolet Manager

Bert M. Lewis, general manager for many years of Nicolet Paper Corp., the 2-machine glassine mill subsidiary of Milprint, Inc., at West De Pere, Wis., died Sept. 10. His death came only shortly after that of Walter Cloud, Sr., manager of the other small De Pere mill, U. S. Paper Mills.

Bonfield Heads Filer City Division of American Box

Don B. Bonfield, vice president of American Box Board Co., has moved from Grand Rapids, Mich., headquarters to the Filer City, Mich., pulp and paper division of the company to be general manager of that division. He took over duties of Bruce W. Martin, who went to Middletown, O., to be Gardner Board manufacturing manager.

Lee Orders New Machine

Lee Paper Co., Vicksburg, Mich., has ordered a new Fourdrinier machine for fine papers from Beloit Iron Works which will practically duplicate the new 130-in. No. 3 Beloit machine with complete differential drive, which was first described and pictured in an exclusive article in PULP & PAPER, Feb. 1952 issue.

These two are the first machines built entirely new for rag content bond, high grade sulfite and other fine papers in the United States for about a quarter of a century. The new machine will replace the 121 in. No. 1. No. 2, which will continue to be operated, is also 121 in.

	Net Sales (000)	Income Bef. Taxes $ (000)	% of Sales	Net Income (000)	Net Per Share
Brown Co. (fiscal yr. ends 11/30)	$ 35,757	$ 3,877	10.8	$ 2,075	$0.78
Puget Sound Pulp & Timber Co.	10,833	3,335	30.8	1,601	2.06
Rayonier Incorporated	40,917	n.a.	-	5,940	2.67
MacMillan & Bloedel Co., Ltd. (fiscal yr. 9/30 - 2nd & 3rd Qu.)	69,599	n.a.	-	9,886	1.13
Abitibi Power & Paper Co., Ltd.	56,070	12,291	21.6	5,346	1.22
Diamond Match Co.	49,725	3,902	7.8	2,102	1.55
Eastern Corp.	10,480	786	7.5	404	1.08
Glatfelter (P.H.) Co.	8,810	1,947	22.1	907	(a) 4.03
Great Northern Paper Co.	22,511	4,032	17.9	2,086	2.09
Hammermill Paper Co.	14,269	n.a.	-	718	0.84
Kalamazoo Vegetable Parchment Co. (fiscal yr. 9/30 - 2nd & 3rd Qu.)	21,763	1,937	8.9	992	1.20
Marathon Corp. (fiscal yr. 10/31 - 2nd & 3rd Qu.)	50,225	9,043	15.3	4,059	1.09
Oxford Paper Co.	27,579	n.a.	-	1,750	1.96
Warren (S.D.) Co.	24,843	2,469	9.9	1,171	1.16
International Paper	331,976	66,505	20.0	30,422	3.06
Mead Corp.	51,340	5,113	10.0	2,473	2.01
Riegel Paper Co.	22,279	1,911	8.6	893	1.71
St. Regis Paper Co.	101,366	15,586	15.4	7,957	1.40
Scott Paper Co.	87,433	15,186	17.4	7,190	2.08
West Virginia Pulp & Paper Co. (fiscal yr. 10/31 - 2nd & 3rd Qu.)	81,350	13,517	16.6	6,693	1.32
Gaylord Container Corp.	43,563	7,720	17.7	3,666	1.36
Union Bag & Paper Co.	51,356	11,564	22.6	5,479	3.09
Container Corp. of America	90,714	16,889	18.6	8,107	3.18
Gair (Robert) Co., Inc.	57,597	n.a.	-	2,705	1.20
National Container Corp.	35,257	2,940	8.3	1,452	0.40
Sutherland Paper Co.	27,678	4,399	15.9	2,111	2.20
Dennison Mfg. Co.	15,686	1,988	12.7	878	1.45
International Cellucotton Products	75,551	n.a.	-	3,734	1.56

(a) - Includes non-recurring profit of $0.76 per share.

REPRESENTATIVE PULP AND PAPER COMPANIES SALES AND EARNINGS—FIRST HALF 1954

The sales and earnings for the first half of 1954 were especially prepared for PULP & PAPER by Cyrus J. Lawrence & Sons, members New York Stock Exchange, from statistical services and published reports. While the figures are believed to be correct, no guaranty is given as to their accuracy.

F. HARWOOD ORBISON. new Gen. Mgr. of Appleton Woolen Mills.

Orbison Succeeds As Appleton Woolen Mills Mgr.

F. Harwood Orbison, newly appointed general manager of Appleton Woolen Mills, Appleton, Wis., comes into that responsibility with a valuable business and engineering training background.

The young successor to A. H. Wickesberg, who retired, was born in Appleton, and graduated from Cornell University in mechanical engineering in 1942 and later went to Harvard Business School for a master's degree, which he earned in 1948. The war intervened and young Orbison saw service at the front in France with Army Ordnance, in which he served as a major. He was wounded while leading a bomb disposal unit in a mine area.

After Harvard, Mr. Orbison decided to get some broad experience in companies other than the Appleton firm, in which his mother was and is still the president. He worked with a steel firm in Milwaukee and later with a screw machine products manufacturing plant in Cleveland. June 1, 1953 he came home to join the Appleton Woolen Mills.

Lots Of Activity Reported in The South

There's no let-up of rumors and reports in the South of new mills or purchase of mills.

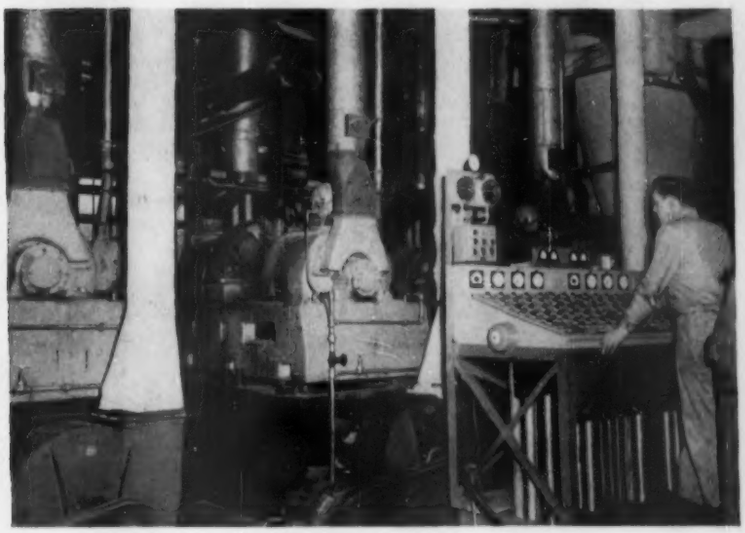
A mill in Louisiana was reported for sale, and later rumors were the deal fell through. Many observers expect Olin to make a long-delayed move for a mill in that area sooner or later.

A Wisconsin paper company is reported getting plans drawn for a new pulp and paper mill in the Demopolis, Ala., region.

Not rumor—but fact—is the taking over of The Mengel Co. by Container Corp. of America, through stock purchase. And it accepted as fact that Scott now will expand its Hollingsworth & Whitney division at Mobile, Ala., to make Scott products.

Two big merger deals involving family ownerships are widely discussed in the South, in each case concerning large, well-known producing companies in the kraft industry.

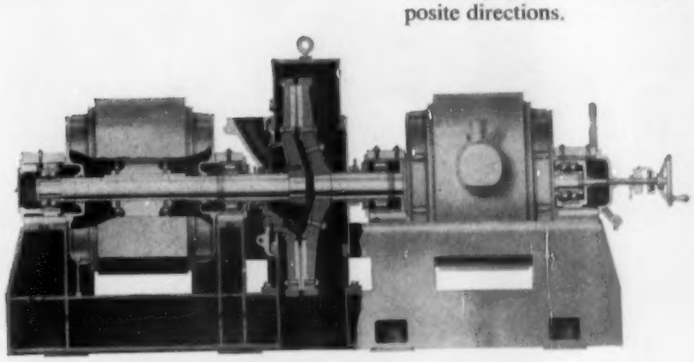
Semi-dry chips fiberized in 6 Bauer Refiners at Coos Bay Lumber Co.



Bauer

Shown in the photograph are three of the six Bauer No. 400 Refiners in the hardboard plant of Coos Bay Lumber Co., Coos Bay, Ore.

Chips from log centers and veneer trimmings are steamed for 5 to 20 minutes. From the cookers the semi-dry chips are distributed to the Bauer Refiners, each of which has two separately powered discs rotating in opposite directions.



Sectional view of Bauer No. 400 Refiner

By the action of the plates, the material is rolled, rubbed and squeezed until the fibers are separated. This tends to make the fibers more slender without being shortened, for the Bauer Refiner essentially is not a cutting machine.

Of course, everyone in the pulp and paper industry recognizes the difference between the fiberizing of semi-dry chips and the refining of pulp slurry at 4% to 5% fluid consistency. Yet Bauer Refiners are used with equal success for both processes, proving their adaptability and versatility. This explains why these Bauer machines are the most widely used disc refiners.

Further information on our refiners, both single and double revolving disc types, will be gladly furnished. You are invited to ask for our literature. Remember, too, that our research laboratory is available for testing the fiberizing, refining, reduction, or mullen development of any material in which you are interested.

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(L to r): CLAUDE A. RABY, Chicago representative for J. M. Huber Corp., Chicago; GUSTAV K. KLAUS, new Chairman of Northwestern Supts. and Converting Supt. at Northern Mills Div. of Marathon, and JACK WATSON, Director of Market Research for Huber clays, who gave talk on printing and printing inks.

Papermakers Need to Know About Printing Inks

More and more printing means more and more paper —and millions of tons a year are required. The papermaker, the printer and the ink maker need to know more about the new ideas and processes in each of these fields, so they can advance together. So, for makers of printing papers, this talk on printing and printing inks, and especially new ink methods, is important. Significant excerpts from this talk, presented at the Northwestern Supts. meeting, Breezy Point, Minn., are presented here.

Papermakers Should Know about Inks

New developments in printing inks, such as instant drying, may require development of new printing papers

By JACK WATSON

• The three basic printing methods are: 1. Letterpress, 2. Lithography, and 3. Intaglio, and inks may be similarly identified. The inkmaker will also classify his inks by the type of printed product, as publication inks, kraft bag inks, corrugated box inks, etc. Still another classification is made which deals with the major printing ink drying methods.

Printing inks are made to dry by physical or chemical means, or combinations of these. Physical drying methods include absorption, evaporation and precipitation. Two other physical methods are solidification and gelation, both of these having had relative brief intervals of application, but not commercially successful. The major chemical drying method is essentially one of oxidation; a second method is curing, which is usually too slow for commercial applications, and a third method is catalytic. This latter is not in commercial use since the proper catalysts for high-speed printing have not yet been discovered. When they are, this method may revolutionize high-speed printing.

ABSORPTION INKS—These inks are probably best typified by the inks generally used in newspaper printing. Newsprint is highly absorbent and acts like a blotter. The inks are therefore formulated to permit fast blotting action. These inks also lend themselves to the printing of books, pamphlets, etc., on soft bulk papers. Such absorbent papers generally require inks of this nature, although certain requirements call for a combination of absorption and oxidizing types.

EVAPORATION INKS—The inks in this group comprise the rotogravure inks printed by the intaglio method, the flexographic inks (formerly aniline inks) printed by cylindrical rubber letterpress plates, and the 20-year-old discovery and development of heat-set inks which have revolutionized magazine printing and hastened the introduction of machine-coated papers.

Heat-set inks are compounded of pigments, binders, and solvents, with the solvents being of such a nature that they are relatively stable on the press at room temperature but can be burned off or evaporated at elevated temperatures. They require the use of drying equipment, coupled and synchronized with the press.

Their most important use at present is in the publication field where they permit very high speeds with instant drying, enabling the printed web to be immediately folded and cut into signatures and often even bound in one continuous operation without smearing, offset, or sticking. Entirely new presses have been designed and are now in operation to take advantage of this heat-set principle and these presses are coupled with a variety of drying equipment. These driers are essentially chambers or tunnels enclosing flame units, steam drums, hot air, infrared units or combinations of these. The paper web is usually passed through a drying unit after one side is printed, then continues into the second printing unit for other-side printing, and on through a second drying unit.

By far the biggest volume of magazine work is done in black and white but the development of 4-color process inks in heat-set formulation has enabled a considerable amount of colored advertising to be transferred from the slower oxidizing-ink-printing to the modern high-speed heat-set press. Much of this 4-color heat-set printing is now being done with inks of high finish and even gloss. The introduction of machine-coated papers to this field, has been of material help to the magazine industry in providing a relatively low-cost coated paper in rolls and in tremendous quantities to keep pace with the needs of the industry.

The degradation of paper by excessive heat is becoming a greater problem as we go to heavier forms and multicolor. Heat degradation of paper in the publication field causes web breaks, folding cracks, lost press time, spoiled paper, overruns, etc. Millions of dollars per year are lost by heat degradation alone.

This type of ink is used extensively in the packaging field. A considerable part of the packaging field is of a nature that permits application of the

Mr. Watson is Director of Market Research, J. M. Huber Corp.

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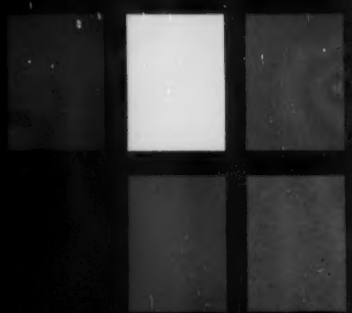
for minimum two-sidedness



A complete range of non-dusting, fast to light dyestuffs, the FASTUSOLS generally produce shades of the highest degree of non-two-sidedness and therefore are of particular interest for coloring all high-grade papers, sulphite bond, ledger and cover papers. All these brands may be added dry to the beaters without showing color specks.

In addition to these valuable properties, most of the dyes in this class are readily bleachable with chlorine for simplified reuse of broke, while some which are not bleachable are of interest for record papers such as ledger, where fastness to ink-eradicator is desirable.

GDC dyes backed by prompt deliveries and skilled technical service will provide the answers to all your paper coloring problems.

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heat-set process. The introduction of heat-set inks to this field permitted instant drying with elimination of offset and smudging. It permitted immediate use of printed rolls on the bag-forming or wrapping machinery and in so doing effected a considerable decrease in floor space required for the storage while drying. Improvement of ink formulation now enables the production of bags printed with high gloss inks having extreme rub-resistance, at speeds close to those of the newspaper and magazine fields and on a variety of surfaces. The modern coffee bag typifies this printing.

PRECIPITATION INKS—These inks are composed generally of poly-alcohols, resins, and pigments. The resins selected are soluble in the glycols only in the presence of a limited amount of water, and when the printed film is exposed to the application of steam or water vapor the resin is precipitated from the glycol, forming a hard resin-pigment film. On most stocks they will set and harden in 15 to 30 min. without extraneous moisture, and on some stocks they are dry enough immediately after printing to rewind without moisture application and without offset.

Precipitation inks have no residual odor, can be waxed within one or two hours, permit good heat sealing, are quite brilliant, have little or no offset, have excellent rub resistance, print sharply, and often give better mileage than inks of the oxidizing type.

This type of ink is assuming major importance in the multiwall kraft bag industry and permits printing and rewinding of continuous paper web at speeds up to 1000 fpm without offset. The high-moisture content of kraft aids in setting these inks rapidly and only with heavy multicolor over-lapping forms is steam or other moisture externally applied. These inks at present do not have much finish or gloss except on special surfaces. Ink laboratories are working on the problem of producing gloss. Their outstanding brightness and rub resistance effectively take the place of gloss finish in producing desirable appearance.

Moisture set inks are used extensively on bread wrappers and other food packages. They are beginning to attain popularity in the printing of corrugated containers. They print sharply on containers and cover smoothly on solid type and reverse type. Colors have life and brilliance. Inks set within 15 min. and are usually rub proof one hour after printing, permitting quick movement to tapers and stitches.

OXIDIZING INKS—Inks in this group are essentially based on vegetable drying oils and rely generally on the printed film absorbing oxygen to promote hardness and drying. Such inks usually set into the paper or board surfaces slowly and require many hours to become completely dry. In many present-day formulations they are modified with absorption, evaporation or filtration inks. Much of the volume printing formerly done with oxidizing ink has been replaced by the evaporation and precipitation types of inks, particularly in long-run roll-fed printing.

OTHER INK TYPES—Two other ink classifications, silk screen inks and fluorescent inks, are becoming of increasing importance. Silk screen printing is done from a design blocked out on a screen. Fluorescent inks are made with certain dyes which are able to absorb and convert visible or invisible light waves into greater intensity and purity of the predominant color.

THE INKMAKER—The modern plant making a full line of inks will have in inventory several thousand separate ingredients, ranging from a few pounds of some to a million or more pounds of others. These ingredients range in price from less than one cent to over $5 per pound.

He has to know all the physical and chemical properties of these several thousand ingredients, the various printing methods and the many specific types of presses used in these methods. He has to know how paper is made, the properties of the various paper and paperboard types and the differences in printability of similar papers from various mills. He has to blend these ingredients to make inks of a million different shades, to print on hundreds of different paper surfaces, on dozens of different presses with speeds from 500 impressions per hour to 2000 web fpm.

The marked progress of the Graphic Arts in recent years has been in no small measure due to the active, cooperative participation of the paper, printing and ink industries.

New types of inks will be developed for new printing techniques and press designs. New papers may have to be developed for these printing requirements. For example, it is possible that inks of the future will need certain chemicals in or on the paper to provide instant drying without heat degradation. It is absolutely essential that ink and paper producers work closely with each other.

FIRE DAMAGE AT INSTITUTE

These pictures obtained by PULP & PAPER of the laboratory fire at the Institute of Paper Chemistry will interest its many graduates and visitors. At left, note how typewriter at right was burned. This is biology office where it started. Robert Balch, technical associate, is cleaning up. Right view shows how fire burned through a door. This is in stream pollution laboratory, with fish-holding tanks in background.

Institute's Fire Fully Covered by Insurance

Former Institute of Paper Chemistry students, now in many mills over the country, will be interested in knowing that damage from the $90,000 night-time fire which destroyed sections of the west end of the laboratories in the Research Building on the Appleton, Wis., campus, was fully covered by insurance.

PULP & PAPER, on a recent visit, saw damage which burned through rooms, doorways, and blew out windows, but as this issue reaches readers it should all be fully repaired.

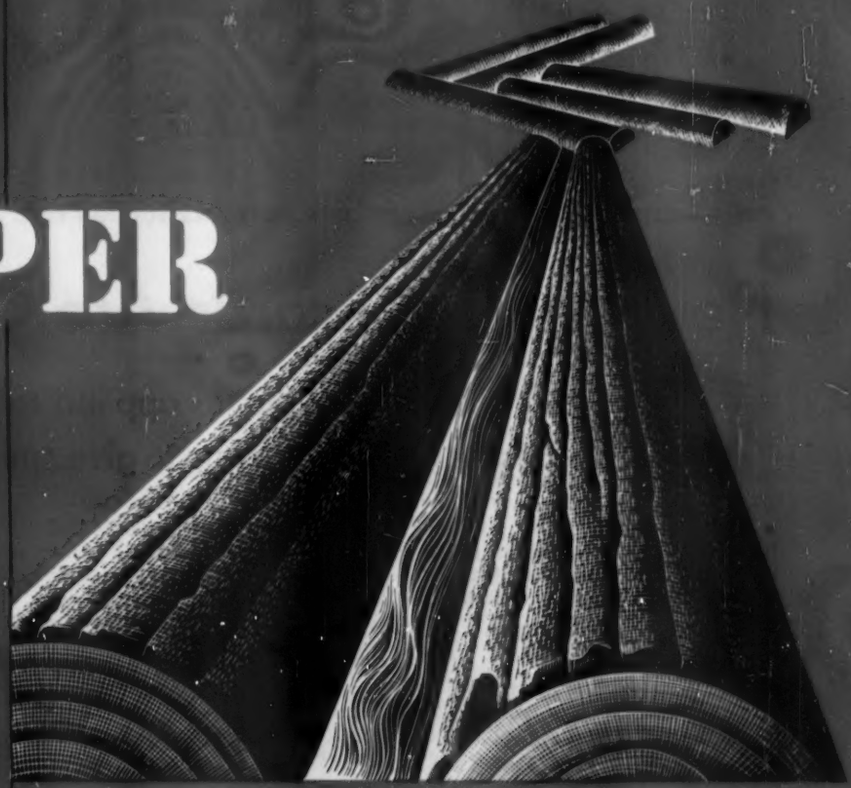
The fire, believed started by an electrical short, was discovered by a watchman at 4:30 a.m., and it was knocked out by the fire department in 38 minutes.

P&J Gets Order

Pusey & Jones will build the new No. 3 210-in. Fourdrinier newsprint machine for Southland Paper Mills, Lufkin, Tex. It will have a suction pick-up arrangement for high speed production.

WOOD PULP

PAPER



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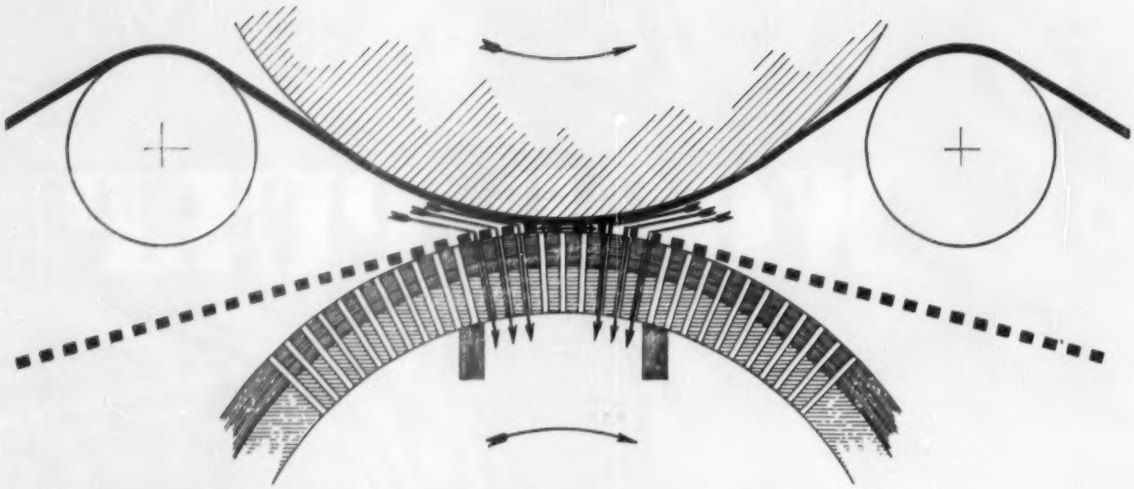


FIG. 1—ILLUSTRATING AIR BLEED PRINCIPLE. NOTE WIDE SUCTION BOX.

New Speed Records Are On Way

"Air bleed" principle, as applied to latest machines, combines with suction pick-up to give speed and other benefits

• A new "air bleed" press principle has made possible a very important advance in paper machine design. Application of this principle to machines of various types has already opened the doorway to sensational new speed records.

Donald R. Simonds, assistant sales manager of Beloit Iron Works, outlined the "air bleed" potentialities at the late September meeting of the Northwestern Superintendents at Breezy Point, Minn. He pictured this arrangement as the most important Beloit innovation since the successful application of "suction pick-up" to high speed machines.

His talk on the subject of press sections (where the patented air bleed principle is applied), was one of the most competent discussions of ways and means for further speed-up and improvement of paper machines that this industry has heard anywhere for a long time. He used slides to illustrate certain key points, but he covered the subject informally without referring to any written notes. Mr. Simonds invited questioners to break into his talk as he went along, and this they did with enthusiasm.

He briefly recalled how the suction pick-up was first applied several years ago at Crossett Paper Mills, where it made possible new records for production of lightweight kraft, such as a speed of 1,950 fpm on 30 lb. kraft. Since that time, Beloit suction pick-up arrangements have been successfully applied to a number of machines on kraft, newsprint, and other types of paper. Installations such as those at Crossett, Ark.; Palatka, Fla.; and Port Angeles, Wash., were first reported and illustrated in PULP & PAPER (Aug., 1954 issue carried first news of new world record for newsprint—2,001 fpm at Powell River, which this development made possible).

NEW SPEED RECORDS SOON—But even such amazing records may soon be dimmed through use of the new air bleed principle and other improvements, predicted Mr. Simonds. This confidence has been implemented by the designing and building of new machines for even higher potential speeds.

The basic principle of the "air bleed" press is to keep the sheet away from the felt except at the nip itself so that air can bleed down through the felt at both the incoming and outgoing sides of the nip. Mr. Simonds stressed that this could only be done where the sheet is strong enough to carry itself safely for short distances. For this reason, the air bleed press is frequently suitable for use in third suction press or second suction press positions, but not at the first.

BIG NEWS FROM BELOIT

FRED R. ERBACH (left) showed slides while DONALD R. SIMONDS (right) did the talking, in revealing how new air bleed principle for machine press sections will help in ceaseless drive for better and faster papermaking.

Figure 1 illustrates one of the "air bleed" arrangements. (Air bleed can also be used in other arrangements, such as with the second suction roll of a dual press or cloverleaf press.) Note that there is a fairly wide suction box, so positioned as to provide approximately equal suction areas on each side of the nip. Unlike conventional presses, this air bleed press brings the sheet into the nip on the surface of the plain roll, and the sheet likewise follows the plain roll out of the nip. Sufficient felt is left exposed

to permit free flow of air and moisture through the felt into the suction box.

Experience has shown that there are a number of related benefits to be derived from use of the patented "air bleed" principle. The sheet itself often may be 2 to 3% drier than if a conventional suction press were used. The action of the air bleed press on the felt itself is somewhat similar to that of a full width felt conditioner, so that the felt is drier and considerably cleaner as it leaves the press, and there is much more uniformity in the dryness of the sheet across its width.

HOW DISCOVERED—Application of the air bleed principle developed directly from the experience of Beloit engineers who were trying to help a book paper mill solve the problem of dry edges on a stock which was to be coated. The paper machine had a dual press arrangement, and each of the two suction rolls had a rather narrow suction box opening.

When trying to track down factors such as drying conditions, the engineers had one trim squirt moved in towards the center to reduce the width of the sheet entering the press section. Curiously enough, this edge of the sheet continued to show the same undesirable dryness as before, even when the squirt was moved clear to the center to let only a half-width sheet reach the press section!

It occurred to the engineers that passage of an additional amount of air through the felt at the edge of the sheet—wherever that edge happened to be—might be giving the felt an opportunity to remove more water in this limited area. Working on this theory, they tried a wider suction box opening in the second suction roll of the dual press and positioned the roll to permit air to bleed freely both above and below the nip.

The results of this change were highly satisfactory. Not only did the dry edges of the sheet disappear, but it was also possible to reduce the dryer section steam pressure materially. The second felt, which previously had shown wet streaks and generally uneven moisture content across its width, became uniformly dry. This reduced the possibility of wet streaks occurring in the sheet.

APPLICATIONS SHOWN—As previously mentioned, the air bleed principle is applicable to a number of press arrangements. *Figure 2* shows the press section of a high-speed kraft machine which includes an air bleed cloverleaf press. Note that the second suction roll of the cloverleaf press has a wide box to permit air to bleed into the suction box through the felt above the nip as well as below.

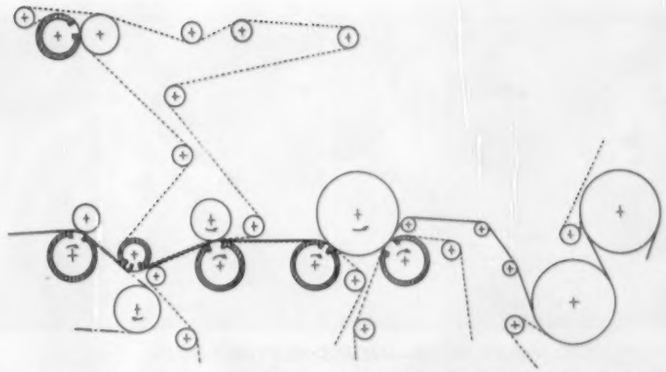


FIG. 2—HOW AIR BLEED PRINCIPLE IS APPLIED TO PRESS SECTION OF KRAFT MACHINE WITH AIR BLEED CLOVERLEAF PRESS

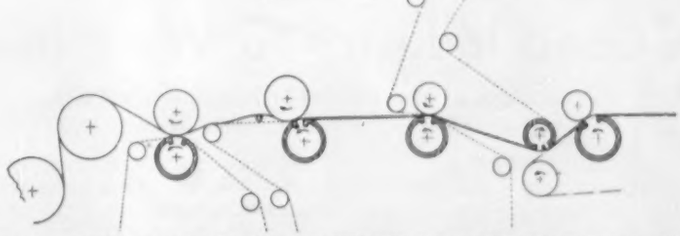


FIG. 3—TYPICAL AIR BLEED ARRANGEMENT NOW ON SEVERAL HIGH SPEED NEWSPRINT MACHINES

Figure 3 shows an air bleed arrangement which is typical of several highly productive newsprint machines. The sheet is taken safely from the Fourdrinier wire by a Beloit suction pick-up roll and carried on the bottom surface of the top felt into the suction first press. The sheet is then carried on the first bottom press felt into the nip of the second suction press. The turning roll for this felt and the succeeding paper roll are used to position the sheet in contact with the plain roll, so that the sheet touches the felt only at the nip of the press.

As an example of the capabilities of this combination of suction pick-up and air bleed, Mr. Simonds reported on a newsprint machine which is running at a steady speed of 1,930 fpm. As there are very few production interruptions, this machine has maintained the remarkable daily average of 2,300 lbs. per in. of trim,—a feat which would have been unbelievable a few years ago.

Plans New Mill

Willamette Valley Lumber Co. is working with Ira C. Keller & Co., headed by Pres. Ira C. Keller, on a kraft mill project for utilizing waste woods from the lumber company's sawmills located in Oregon's Willamette Valley.

Alberta Pulp Mill Board is Formed

Five of the nine members of the newly elected board for North Western Pulp & Power Ltd., builders of a new 300-ton bleached kraft pulp mill at Edson, Alberta, are St. Regis men. St. Regis is partner in the enterprise with North Canadian Oils, Ltd., and St. Regis will operate the mill and utilize and sell the pulp.

St. Regis board members are Roy K. Ferguson, who is president of the new company; E. R. Gay, who is executive vice president; William R. Adams and Arch Carswell, who are v. p.'s, and W. H. Versfelt, treasurer. Frank E. Rubens of NCO is chairman of the board. Other members are Robt. Ruben, Hugh Griffith and Gordon Allen.

Gschwind Heads Ross Firm in Dayton

C. F. Gschwind, long active in J. O. Ross Engineering, is new general manager of its subsidiary, Ross Midwest Fulton Corp., Dayton, O. Acquisition of Midwest Fulton by Ross was previously reported.

William Knoll, formerly v. p. and general manager of Midwest Fulton, is continuing in an advisory capacity.

OLD OFFICERS SHAKE ON IT—NEW ONES TAKE OVER

MYLES REIF (extreme left), Vice Pres. and Gen. Mgr. of Blandin Paper, retiring Chairman of Northwest Supts., shakes hand of his Secy., ROBT. E. HARPER, Director of Purchases, Rhinelander Paper Co. L. to r. in group at right are new officers: JOE J. JENKINS, Finishing and Shipping Supt., Northwest Paper, new 2nd Vice Chairman; GUSTAV A. KLAUS, Converting Supt., Northern Mills Div. of Marathon, new Chairman; ARTHUR H. BUNKS, Prod. Mgr., Consolidated, Appleton, Secy., and JOHN McPHERSON, Asst. Mgr., Mosinee Paper, First Vice Chairman.

A Good Industry to Work In—

Records of new officers in Northwestern Division prove it, sticking with same mills for many years

• Two new officers of the Northwestern Supts. have worked all their lives in the same town where they were born, always with the same mill—indicating this is a stable industry and a good one to work in. Their records—31 and 35 years with the same companies.

Gustav K. Klaus, new chairman, decided to stick around a while when he joined Northern Mills, now a Marathon division, in his native Green Bay, Wis., after graduating from the U. of Wisconsin in 1923. He's been there ever since. Has been converting supt. since 1940.

But Arthur H. Bunks, new division secretary, beats that record by 4 years. Out of war service in 1919, he chose Consolidated Water Power & Paper Co., instead of another firm that went broke. He was born in Appleton and went to work there. After 35 years, he admits it's getting to be a habit. He has been production mgr. of the sulfite pulp mill since 1943.

The two younger officers of the division can't match those records, but they haven't been fickle, either. John A. McPherson, first vice chairman, was born in Milwaukee, graduated from U. of Wisconsin. He went to Mosinee Paper Mills as project engineer in 1946 and is now assistant manager.

Joe Jenkins, new second vice, was born in Manistique, Mich., but moved to Duluth and as soon as he got out of Junior College there, 21 years ago, he went to work at the nearby Cloquet mill of Northwest Paper Co. He became asst. to the manufacturing mgr., now is finishing-shipping supt. Recently he addressed high school students in his town on paper industry opportunities. He knew what he was talking about.

New "first ladies" of this Northwestern Division, of course, are the wives: Pearl Klaus, Patricia McPherson, Virginia Jenkins and Esther Bunks.

Peddlers Organize as PAPAS

Up at Breezy Point, Minn., during the Northwestern Superintendents fall meeting, a new association was born and it adopted the name, Pulp and Paper Affiliates, or PAPAS, for short.

Some 37 sales and service men of supply firms, meeting under the chairmanship of Leo Fitzgerald, Milwaukee manager for Hercules Powder Co., decided to form the new group to lend support to both Tappi and Superintendents meetings in that area.

One of the first important actions taken by the new PAPAS was to pass unanimously a resolution recommending that the Northwestern Superintendents hold only one "good" meeting a year, instead of two, as they do now.

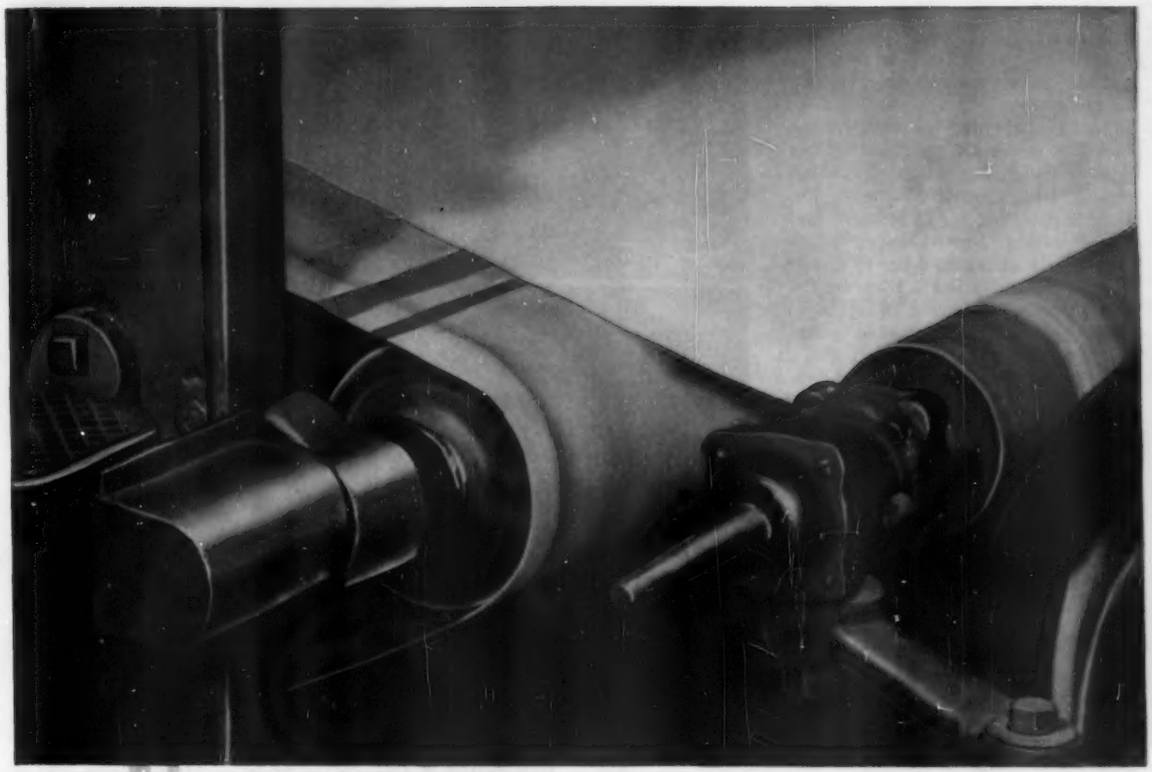
The former title of the group was "the Suppliers Group of the Northwestern Division of the American Paper and Pulp Mill Superintendents Association."

Actually, the PAPAS claim an unofficial "membership" of 351 men, an amazing number, revealing how many sales and service men travel in that area, including a great many living in Appleton, Wis., Milwaukee, Chicago and Kalamazoo, Mich.

Lloyd Greiner, co-owner of Benlo Chemicals, Milwaukee, was elected

SUPERINTENDENTS AND PEDDLERS HAVE FUN IN MINNESOTA

(Upper left), Group in view Dome car of Milwaukee Road, traveling in special group from Milwaukee headed by LEO FITZGERALD, in front seat.
(Upper right), Speed boat rides on lake was popular when sun momentarily came out.
(Lower left, l to r): HAROLD HUSEBY, Northwest Paper bleach plant supt., RICHARD AHRENS, Impco's Appleton man, and PHIL BUDD, Asst. to Mfg. Mgr., Northwest Paper, kibitz the trapshooters
(Lower right): Here are two of them blasting the "birds"—MARGARET FITZGERALD, Milwaukee, and FRANK ALDRICH, nearest camera, Sulfite Supt., Consolidated W. P. & P. Co., Appleton.



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In analyzing production records, paper mills find that Albany Felts give *more tons per day*. Of equal importance, they are consistently producing more *saleable* tons! Time after time, Albany Felts show record production of saleable stock by maintaining sheet quality and greatly reducing rejects. This is further translated into more mill profit.

The big difference between Albany Felts and others is in the unparalleled combination of Albany's advanced research program, custom-designing, rigid quality controls in manufacturing, and outstanding field service. These give you uniform top quality felts plus valuable help on your felt problems.

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first president of the new PAPAS. Jack Ayers, E. D. Jones & Sons, Appleton, Wis., was elected secretary.

About three years ago, the idea that these salesmen might assist the Lake States Tappi group as well as the Superintendents was proposed by Leo Willoughby of Staley and Mr. Fitzgerald after a conference with Dr. Alan Adrian, director of research and manufacturing, Neenah Paper Co. A year ago the salesmen voted to accept an invitation extended to them by the Tappi section to sponsor the section's annual spring outing cocktail party. This is, hereafter, expected to be a fixture. The decision to change their name and cut off exclusive ties with the Superintendents did not come until this fall.

In recommending a single Superintendents meeting, the group would thus divide its attentions equally between that event and the Spring Fun Day of the Tappi section. Speakers at the salesmen's meeting commented that distances between mills in the division entailed too much travel for two successful meetings, and this was one reason why only 24 mill men were registered at Breezy Point, out of a total of 134 men registered (not counting women present). At the division's Minneapolis meeting a year ago, there were 51 mill men and 184 other men (but the former represented 21 mills).

Better technical programs could be prepared for one meeting a year, it was held.

SCOOP! FITZ BUYS BRAVES—IT SAYS HERE

Everyone knows Milwaukee has gone daffy over their new big league ball club, but it was "news" when HUBERT (BERT) D. MacDONALD, (upper left), Ohio Knife man based in Chicago, turned up at Breezy Point meeting with a few copies of a specially printed newspaper bearing the headline: "FITZGERALD BUYS MILWAUKEE BRAVES. . . Hercules Powder Man has controlling interest."
Lower left: LLOYD GREINER (left), President of new PAPAS, joins LEO and MARGARET FITZGERALD in admiring the "extra edition." Mr. MacDonald got the idea when he heard how Fitzgerald had attended so many games this year that his friends thought he merited a part ownership.
Lower right: (l to r): RAY TOTTEN, Ciba rep. in Appleton; JACK AYERS, also of Appleton, for E. D. Jones, who is new Secy. of PAPAS, and LEWIS WITHAM, from Mobile, Ala., making a nation wide tour for Ciba Chemical. Mr. Witham started in this industry in Southern Advance paper mill in Hodge, La.

Allis-Chalmers Believes in Manpower at a Meeting

Seven men were representing Allis-Chalmers Mfg. Co., at the Superintendents' meeting at Breezy Point, Minn., including sales representatives from three cities in the Northwest and specialists in vibrating screens and pumps. There would have been eight if Aubrey Phillips, new manager of the Milwaukee sales district office, had been able to carry through his plans to attend.

Distance and weather probably cut down drastically the number of mill men at the meeting, but one A-C spokesman said in a meeting that his company still figured their big delegation was worthwhile, because they learned of new things going on in the industry from other suppliers.

James Fink, application engineer in the vibrating screens department, who authored an exclusive article on these screens in PULP & PAPER (Oct. 1953 issue) was there. So were Frank Forrest and Roland Hermann, pumps applications engineers. Sales representatives were N. H. Christianson, from Minneapolis, Ray O. Wenz, from Duluth, and Harold L. Gruehn and John Ernst, Jr., from Milwaukee.

THE WINNER STAYED UP ALL NIGHT!

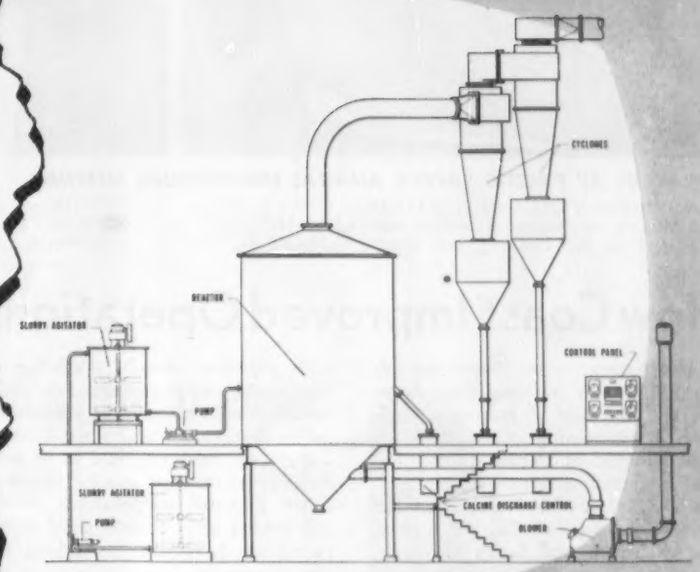
JOSEPH M. STINER (left), of Appleton, Wis., representative of John W. Bolton & Sons, is congratulating C. CREIGHTON (Chuck) STEVEN (right), Industrial Engineer, Cornell Paperboard Products, Milwaukee, who stayed up all night writing the essay on obligations of employes to their companies which won the 1954 Bolton Award in the Northwestern Supts. Division. Born in Milwaukee, Mr. Steven was a Marine radio technician in the war, graduated from Wisconsin in 1949, and works on production control systems at Cornell.

ALLIS-CHALMERS MEN TURN OUT IN FORCE

There were 7 Allis-Chalmers men at Breezy Point, Minn., but PULP & PAPER was able to get only these four together at one time for a picture (l to r): HAROLD L. GRUEHN and JOHN ERNST JR., both Sales Reps. from Milwaukee; JAMES FINK, Vibrating Screens Dept., Application Engineer; and RAY O. WENZ, Duluth Sales Rep.

Sulfite Pulp Producers

Are you satisfied with present methods for obtaining SO_2 for cooking liquor?



If a long term supply of elemental sulfur is meeting your acid requirements, you're probably more than satisfied.* But if high sulfur costs or seasonal interruptions in supply are a headache, a Dorrco FluoSolids System may be just the answer to your problem. Why? Because FluoSolids makes it possible to tap available supplies of pyrite, pyrrhotite and other sulfur bearing ores as an economically feasible and reliable source of high strength SO_2.

Tangible proof of FluoSolids' ability to deliver is the fact that seven Systems are now in operation, and two more are being installed in sulfite pulp mills, in the U. S., Canada and Norway for the production of SO_2 for their entire cooking liquor requirements. Eighteen more are in operation or being installed to produce SO_2 from pyrite, zinc and low grade sulfur ores at acid plants, which will produce over a million tons per year of H_2SO_4.

If you would like more information on FluoSolids — the most significant advance in roasting technique in the last 30 years — write for Bulletin No. 7500 to The Dorr Company, Stamford, Conn. or in Canada, The Dorr Company, 25 St. Clair Avenue East, Toronto 5.

*That is, if you're not bothered by weekend or other startups and shutdowns of the sulfur burner. If you are, the FluoSolids Process will also stand investigation. To shutdown an FS System it is only necessary to stop feeding and stop the blower. The fluidized bed subsides and the reservoir of heat is sufficient to bring the Reactor back to roasting temperature by simply starting the blower and feed. Reactors have been down for three days and started up again within half an hour without adding fuel.

FluoSolids is a trademark of The Dorr Company, Reg. U. S. Pat. Off.

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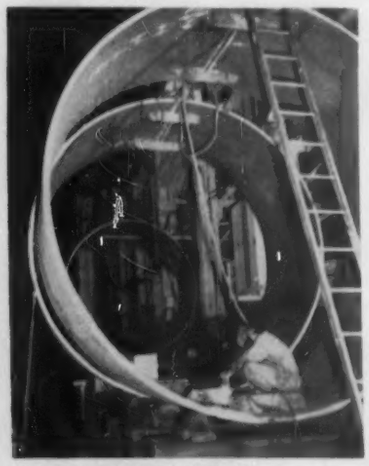
SPEAKERS AT PACIFIC TAPPI'S ANNUAL ENGINEERING MEETING

(Left) Moderator LELAND F. MAYBACH, Crown Z, Camas, gets briefing on continuous cooking from LENNART LUNDBERG, of A. H. Lundberg, Inc. (Right) ROBERT PLANKINGTON, of Crown Z, West Linn, displays flow chart to GEORGE CONNER, of Willamette Iron & Steel Co., and T. W. LEEDHAM, Crown Z, Camas.

How Coast Improved Operations

● Continuous cooking, improving sulfite pulp quality, welding kraft digesters and the role of industrial engineers in increasing plant efficiency were featured at Pacific Tappi's annual engineering session Sept. 29 at Portland, Ore. Ed Nunn, assistant resident manager of CZ West Linn, was chairman, and L. F. Maybach, project engineer, CZ Camas, was moderator.



TOPIC OF DISCUSSION

Kraft digester welds in various stages of completion in plant of Willamette Iron & Steel Co.

Lennart Lundberg, of A. H. Lundberg, Inc., said the Kamyr continuous cooking offers production economies and is capable of producing a kraft pulp equal to that made by batch systems. Although present installations are only for 30 to 60 tons per day, he reports three 100-ton mills will be in production shortly, the first at Wifstavarf, Sweden.

How adaptations enabled one mill to manufacture improved sulfite pulp with digesters already operating at top capacity were presented by Robert Plankington, technical assistant to sulfite superintendent, Crown Z, West Linn. Two conditions had to be met, he pointed out, for quality improvement: Digester temperatures should not exceed 285° F. and good liquor circulation is needed throughout the digester charge.

Additional sulfur dioxide was required in the digesters to take the place of heat before maximum cooking temperatures could be reduced. Modifications consisted of cutting a pressure tower, atmospheric tower and tail gas tower into the relief recovery system; installing a large single sulfur burner and combustion chamber in place of three older units, and adding a compressor-equipped raw acid booster tower.

T. W. Leedham, division industrial engineer, Crown Z, Camas, said:

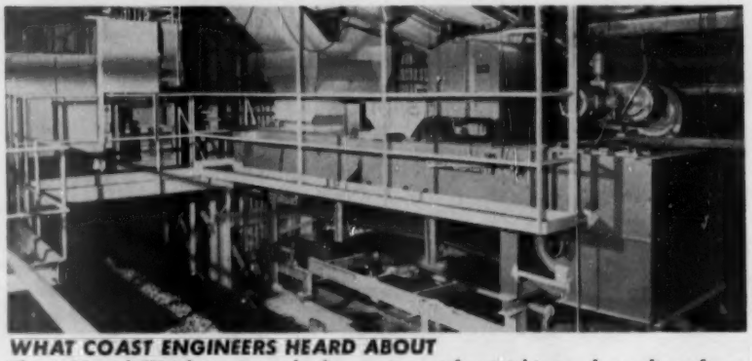
"Engineering projects either considered or completed at the Camas mill are: Improving ways of unloading and transporting sulfur arriving at the mill; sampling and weighing purchased wood chips, especially compacted chips; pattern loading and unloading of palletized materials, installing mechanical waste paper baler in converting plant, so wastes of various characteristics can be economically stored separately for reconversion when that product is again produced."

The industrial engineer's outlook: "If you have been doing a job a certain way for over five years it is time to check to see if there is some better way of doing it."

George A. Conner, welding engineer of Willamette Iron & Steel Co., Portland, presented a paper covering fabrication an all-welded stationary kraft digester. Willamette is completing the first such unit produced in the Pacific Northwest for a Columbia Valley mill. He also said it was feasible to manually weld a patch in existing digesters.

Haul Water by Barge

Probably the first mill to ever haul water by barge to keep up operations is International Paper Co.'s Georgetown, S. C., mill. In a brief period of salt water difficulties, water was hauled from a nearby river in barges.



WHAT COAST ENGINEERS HEARD ABOUT

This is Merrick Weightometer and other equipment for weighing and sampling of purchased chips received at the Camas, Wash., mill of Crown Zellerbach. The cabinet at extreme left contains a chip drying oven. In center of picture is sampling equipment and equipment extending from center to righthand side is Weightometer.

first cousin to magic

Equip that old dryer with the correct Fulton Drainage system and you'll be as quick as others to call the benefits magic.

Substantially increases drying capacity . . . Dries the sheet uniformly clear across . . . Holds moisture content more even . . . Eliminates excessive shrinking, cockling, curling, wet streaks . . . Reduces breaks and broke losses . . . Materially reduces steam costs.

Since any one of two of these benefits alone justify the installation of Fulton Systems, is it any wonder that all recently built machines have Fulton Systems?

Is it any wonder that operators of old machines or small machines now "see the light" and are installing Fulton Systems as fast as we can engineer them?

Cost—less than you think . . . Get the facts now and decide now.

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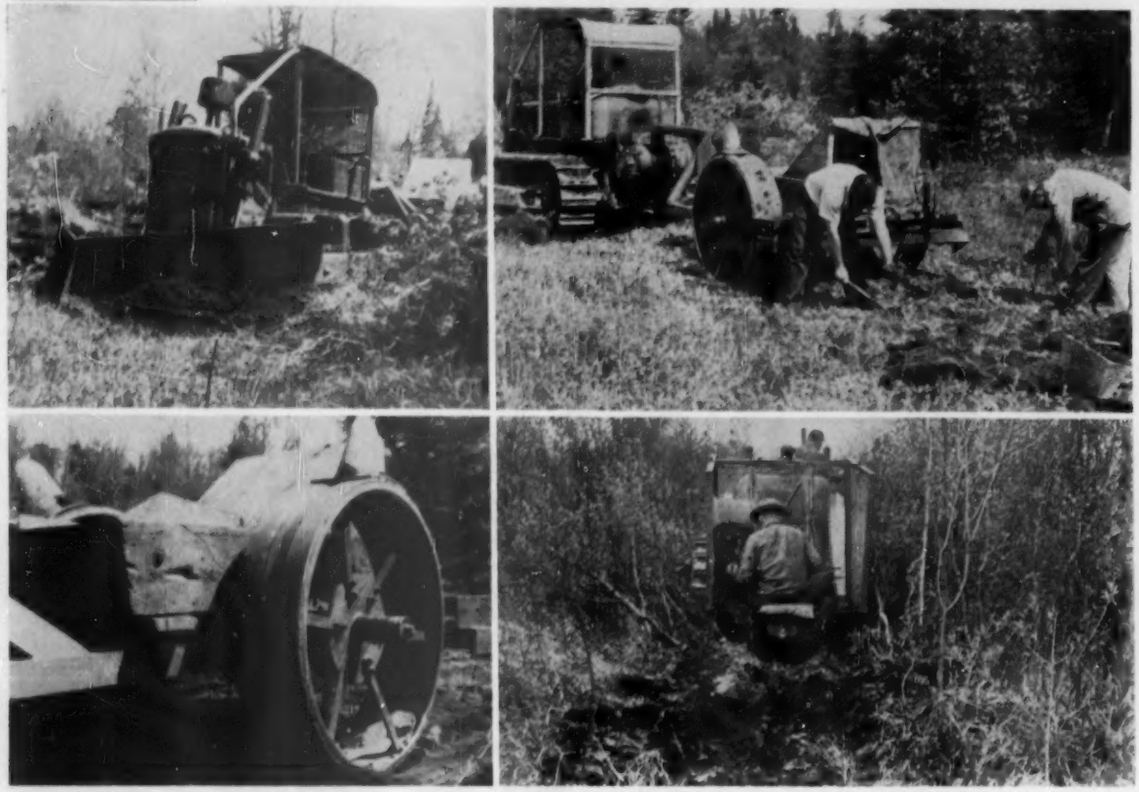


KIMBERLY-CLARK IMPROVES SEED PLANTING

FIRST, GROUND IS "SCALPED" (top, left). V Scalper is mounted on Allis-Chalmers HD-5 tractor with Baker Bulldozer attachment. It scalps off heavy sod.
NEXT, HOLES ARE DUG AND PLANTED (top, right). On other side of A-C tractor, big lug or point on top of wheel digs hole. Planters follow.
CLOSE-UP OF HOLE DIGGER (below, left). Two of hole diggers can be seen at top of wheels; two others on opposite side are in ground. Two rows are thus prepared.
ANOTHER PLANTING TECHNIQUE (below, right). Modified Lowther planter, pulled by A-C tractor, plants brushy site to white spruce. V Scalper is in front.

What Kimberly-Clark is Doing

To improve forest production for their mills as well as to increase yield per acre

By George R. White and John Calkins

The authors of this article are Lake States representatives of American Forest Products Industries Inc. They were recent guests at Kimberly-Clark Corp. forest operations and wrote this article especially for PULP & PAPER.

• Kimberly-Clark Corp.'s expanding forest activities, aimed toward more scientific and more improved forest practices and management, were highlighted at a recent dedication of a 62,885-acre industrial forest into the national Tree Farm program at Two Harbors, Minn.

The new tree farm belongs to Kimberly-Clark's North Star Timber Co., of Duluth, Minn. Within this farm is a 9,000 acre experimental forest where the company carries out investigations for improving forest regeneration and growth.

Although most of these forests are good stands of young and growing timber, much of the planning for the future has to include restocking by mechanical or hand planting. When Atley P. Chapman, superintendent of North Star's Knife River nursery, surveys the long, neatly kept seedbeds in which hundreds of thousands of small trees stand green and growing, his pride in the job they will soon be doing for Kimberly-Clark is evident. Planting stock from this nursery supplies Minnesota and Michigan woods operations of the company.

Kimberly-Clark's other holdings in U.S. and Canada include William

West Virginia Pulp & Paper Co. FOR THE 9TH TIME...

CHOOSES **LORAIN** FOR LOW-COST PULPWOOD HANDLING

No matter how you look at it, the Luke, Maryland mill storage yard of the West Virginia Pulp & Paper Co. gives proof that it pays to use Lorains for pulpwood handling. These two views show this operation from two different angles—but both show Lorains at work loading peeled pulpwood from storage pile to chip cars. At the left is their newest Lorain—below, one of their two Lorain Moto-Cranes at this mill. All in all, West Virginia have bought nine Lorains for use in their mills and woodlands operations.

This progressive company found out long ago that it is faster, cheaper, safer to handle wood with Lorain Cranes rather than by hand. The mechanization of this operation is part of their continuous program of modernization designed to lower costs, increase profit.

Why don't you, too, modernize your pulpwood handling operation? The savings in time, money and manpower—plus safety—can be yours, too. To fit your mill, you can select a Lorain pulpwood handling crane in a variety of sizes up to 61 tons on crawlers—45 tons on rubber tires.

Your nearby Thew-Lorain Distributor is always ready to serve.

THE THEW SHOVEL CO.
Lorain, Ohio

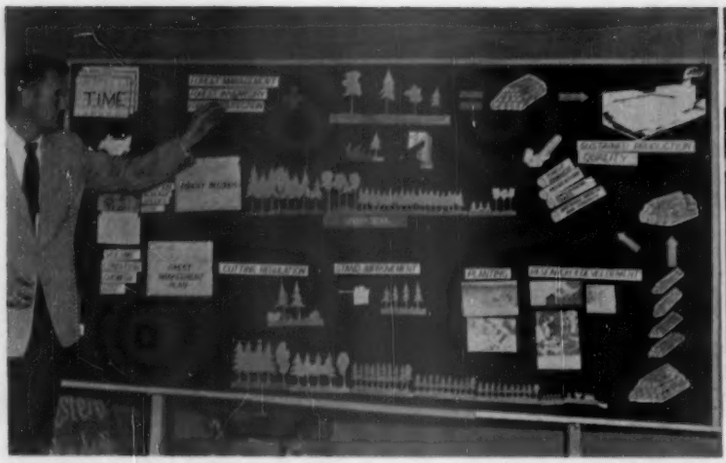
▲ ON CRAWLERS

Newest Lorain at West Virginia Pulp & Paper Co. is this model TL25-KS crawler crane, using a ¾-yd. grapple to load peeled pulpwood from yard storage pile to mill chip cars. Note the extra-long and wide crawler that provides maximum stability and lifting capacity throughout 360° swing.

ON RUBBER TIRES ▶

This four-year-old Lorain Moto-Crane, model MC-254, has more than paid its way at the Luke, Maryland plant. Rubber-tired mobility permits this versatile crane to be used in mill operations like this, when needed, or to be dispatched quickly to the woods for truck loading duty. If you are looking for mobile crane power, your Thew-Lorain Distributor offers the most complete selection of cranes on rubber.

FOR PULPWOOD HANDLING IT'S... THEW **LORAIN**



WHAT K-C AIMS FOR IN WOODS MANAGEMENT

On this flannelboard is graphically shown the aims of Kimberly-Clark in management of its North Star Timber Co. Tree Farm in Lake County, Minn. Pointing the ruler is DIXON SANDBERG, a company Forester. North Star Timber Co. is wholly owned by Kimberly-Clark.

TREE FARMERS COME IN LARGE AND SMALL SIZES

Little fellow is BOGUE SANDBERG, 5, of Duluth, Minn, youngest certified Tree Farmer in U. S. Behind him is HAROLD OLSON, of Wood Conversion Co., Cloquet, Minn, Chairman of Minnesota's Tree Farm Committee. At right is NEIL McKENNA, of Duluth, Mgr. of North Star Timber.

Bonifas Lumber Co., Iron Mountain, Mich., which has a 112,000 acre Tree Farm.

"THE SCALPER" PLANTER – As an example, Neil J. McKenna, manager of North Star, realized that difficulties encountered in planting were seriously expending much valuable labor and time. To overcome this, planting supervisors and machine crews designed a planting machine which could travel in the rocky terrain heavily choked with shrubs and bushes. A large V-shaped blade, mounted on the front of a diesel tractor, scalps or clears a path, pushing aside the undesirable brush, rocks, and slash. The special wheels on the 2-row hole-digger has bars or points welded on the outer rim which punch holes in the ground as it revolves. These bars are so placed that with each revolution holes are sliced at 6-ft. intervals in the cleared path. Hand planting crews follow up to place seedlings in the holes.

Aerial spraying to retard the growth of undesirable species and bush growth is being practiced on the experimental forest. Highly selected contact and translocated chemical sprays are applied by low-flying planes on strips of timber. Defoliation of "weed trees" and brush growth is evident in large swaths of brownish streaks which tell the story. Younger and healthier desirable species are expected to get a strong foothold and overtop the brush. Several continuous sprayings over a period of years will probably be necessary, said K-C's chief silviculturist, J. B. Miller. First spraying was in July, 1954.

Selective cutting, thinning, improvement logging for stand advancement and other control and protection practices are also expected to bring a greater return for investment. An increase in quantity and a continuous supply of wood products is the ultimate aim, states Wm. J. Brown, forest economist of Kimberly-Clark.

LOADING PULPWOOD

Giant crane and grapple loads truck with pulpwood for Kimberly-Clark Corp. Compare size of workmen with equipment which is used in this operation.

WHERE IT BECOMES PULP

Destination of considerable portion of Kimberly-Clark wood is this Niagara, Wisc., Groundwood - Sulfite-Book Paper mill. It has three Fourdriniers, two 158-in. and one 246 in.

HAS 125 FORESTERS–More than 125 professionally trained technical foresters are working in the many divisions of Kimberly-Clark, said to be the largest number for a forest

Pheno Fast Yellow 8G
Pheno Fast Yellow 6G
Pheno Fast Yellow AP
Pheno Fast Yellow AP Conc.
Pheno Fast Yellow 95 Conc.
Pheno Fast Orange E3GL
Pheno Fast Orange EGL
Pheno Orange O
Pheno Orange 5RE
Pheno Fast Orange ERB

Pheno Fast Yellows and Oranges offer you these important differences: they are quality-controlled in every step of manufacture to assure superior development and uniform results in a wide variety of papers, and to impart to canary papers bright greenish yellows hitherto unobtainable with stilbene dyes.

Listed in order above, they range from a greenish yellow through yellows of increasing redness up to the red-orange Pheno Fast Orange ERB.

Cyanamid's Pheno Fast Yellows and Oranges have been improved to the point where they give the quickest and best color value in the cold-water, quick-pulping equipment generally used in the industry.

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HEADS K-C WOODS OPERATIONS

ROBERT LYONS, Vice Pres. in charge of Woods Operations.

industry in the Lakes States region.

One of its new units is an Entomology-Pathology Laboratory at Iron Mountain, Mich., staffed by three technicians, L. M. Argetsinger, Paul Flink, entomologist, and Donald Prielipp, plant pathologist. They are engaged in research and ecological studies pertaining to forestry and related fields. This is probably the only wholly industry-owned and operated forest research lab of its kind in this country.

"We are learning fast to use science and research to give nature a boost in growing more valuable timber in less time," says Robert R. Lyons, Kimberly-Clark vice president in charge of woodlands operations.

AFA FIELDTRIPPERS VISIT WASHINGTON MILLS

(Left) Attendants at first Pacific Northwest American Forestry convention (Left) J. K. KAYLOR, Director of Mayland Forests and Parks, J. C. ROBINSON, Asst. Log Buyer of Everett Pulp & Paper, and R. L. DELONG, Res. Woodlands Mgr. of St. Regis Tacoma, examine paper produced at Crown Z Camas mill. (Right) Fieldtrippers visit Longview Fibre Co., Longview, plant which does outstanding job of utilizing leftover wood from area's mills for making kraft paper and board.

AFA Hold First Meeting in Pacific Northwest

● From all over the nation foresters, industrialists and others interested in conservation attended the American Forestry Association's 79th annual convention in Portland, Ore., in September. First such session ever in the Pacific Northwest, it drew over 500.

"Conservation and Utilization," the convention theme, was presented through a one-day program and three field trips via bus caravans in Oregon and Washington. The general committee, headed by Chairman E. P. Stamm, vice president of Crown Zellerbach, developed a comprehensive program covering tree farming, utilization, integrated industries, forest rehabilitation, water resources, parks, multiple-use plans, protection and government forests.

Indicating the current industrial approach to forestry and forest utilization, Pres. J. P. Weyerhaeuser, Jr., Weyerhaeuser Timber Co., Tacoma, Wash., called tree farming, coupled with wise crop use, true conservation. E. C. Rettig, of Potlatch Forests, Inc. managerial staff, Lewiston, Ida., stated the Western pine region "is growing a crop measured in cubic feet equal to the drain" and has capacity for ultimate growth much greater than that of today's 100 bd. ft. per acre drain for commodity use.

WINNING CONSERVATION AWARDS

F. PAUL KEEN, U. S. Forest Service, Berkeley, Cal.; Dr. SAMUEL T. DANA, U of M School of Natural Resources, Ann Arbor, Mich.; AFA Awards Committee Chairman ROBERT N. HOSKINS, Seaboard Air Line Railroad, Norfolk, Va.; REUBEN BUCK ROBERTSON, SR., Chairman of the Board, Champion Paper & Fibre Co., Flat Rock, N. C.

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the Most Experienced Pulp and Paper Companies Prefer Blaw-Knox Grapples

Outstanding performance and dependability resulting from many years of Blaw-Knox design experience are only two of the many reasons why the leading Pulp and Paper Companies continue to place repeat orders for Blaw-Knox Pulpwood Grapples.

Blaw-Knox Company is the foremost expert in designing Grapples for the economical handling of symmetrically stacked pulpwood.

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FOR PULPWOOD AND LOGS

MODERNIZE with a NORTHWEST CRAWLER!

For the big mill the smoothness of Northwest operation, the ease of travel, the ability to give high output means improved pulpwood handling.

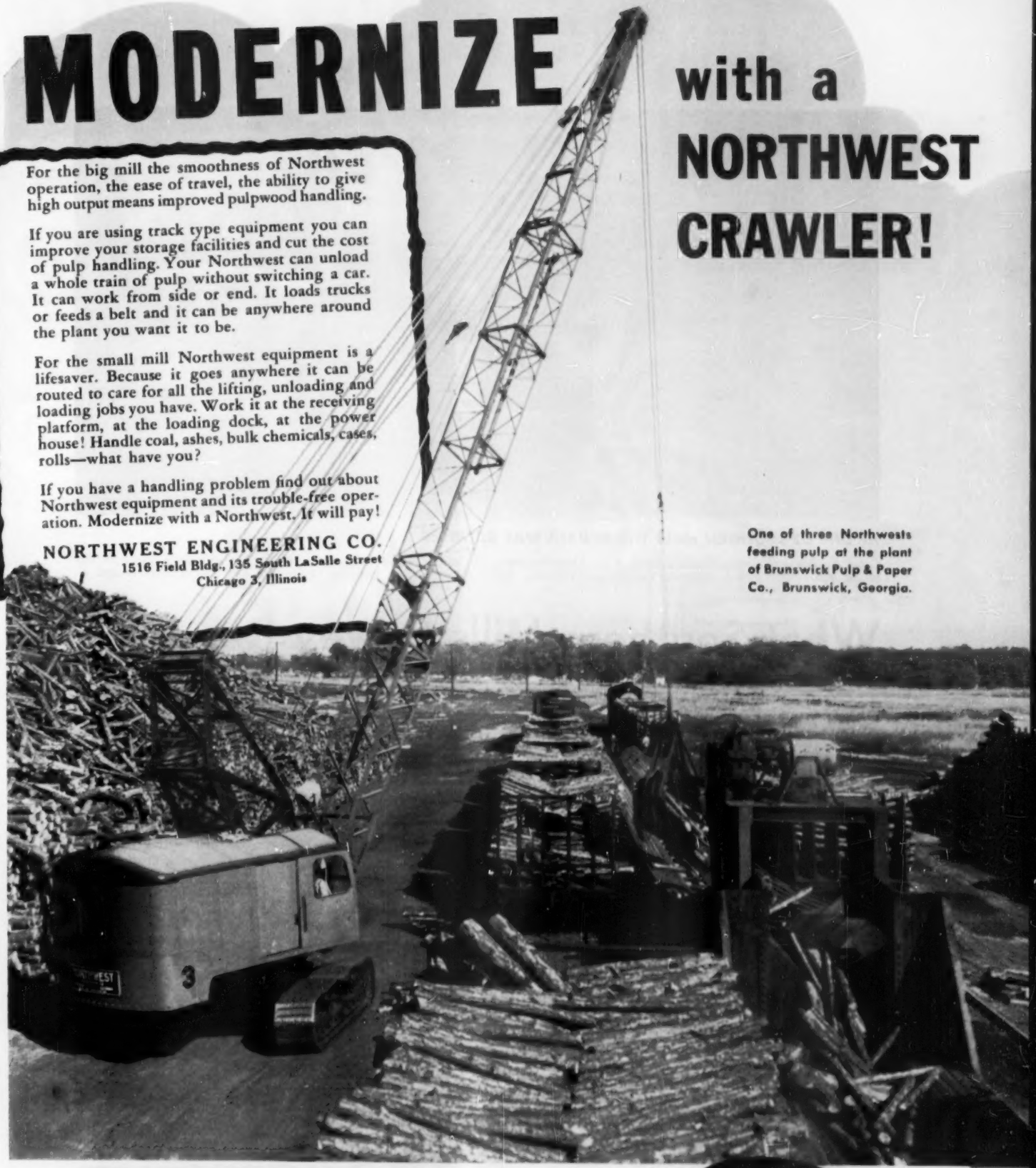
If you are using track type equipment you can improve your storage facilities and cut the cost of pulp handling. Your Northwest can unload a whole train of pulp without switching a car. It can work from side or end. It loads trucks or feeds a belt and it can be anywhere around the plant you want it to be.

For the small mill Northwest equipment is a lifesaver. Because it goes anywhere it can be routed to care for all the lifting, unloading and loading jobs you have. Work it at the receiving platform, at the loading dock, at the power house! Handle coal, ashes, bulk chemicals, cases, rolls—what have you?

If you have a handling problem find out about Northwest equipment and its trouble-free operation. Modernize with a Northwest. It will pay!

NORTHWEST ENGINEERING CO.
1516 Field Bldg., 135 South LaSalle Street
Chicago 3, Illinois

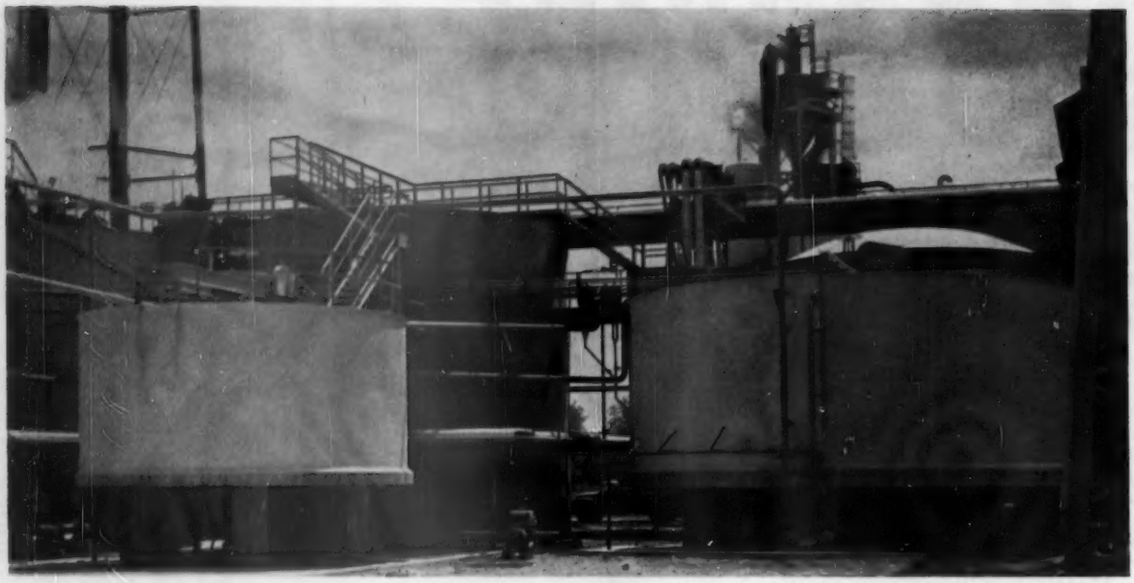
One of three Northwests feeding pulp at the plant of Brunswick Pulp & Paper Co., Brunswick, Georgia.



NORTHWEST

The Crane That Goes Anywhere

10 to 50 TONS



AT ONE OF SOUTHERN MILLS WHERE DATA WAS GATHERED

General view of the green liquor section of the Dorr Recausticizing System at National Container Corp.'s new Valdosta, Ga. mill showing dregs washer on the left and green liquor clarifier to the right. Both are of the new unit compartment design.

What Southern Mills Survey Reveals

About a new clarification principle which simplifies causticizing problems, cuts investment and operation costs

By W. B. GERY

● Recausticizing practice has, in recent years, undergone a variety of changes, all of which have been concerned ultimately with improving white liquor quality and simplifying operation of the chemical reclaiming system. Many of these improvements in operating practice have been initiated by those most closely associated with the operation—the pulp mill superintendents and caustic room operators. However, those responsible for the design and manufacture of recausticizing equipment have been concerned with the operator's problems and have also been constantly striving to improve and simplify the system.

Last year the technical press reported a number of recent developments by The Dorr Co. in recausticizing. Among these were several operating suggestions resulting from a survey of 27 Southern pulp mills, in which superintendents and operators voiced their opinions concerning methods of controlling the slaking operation more closely, reducing pump maintenance, and preventing scaling in the lines. In addition, three new variations in the recausticizing system—two-stage slaking, two-stage causticizing, and a new design of green liquor clarifier and dregs washer—were revealed to be in commercial operation at different mills in this country. The last mentioned of these developments, that of the new clarifier design, is probably the most far-reaching in its effect and has now been applied to a total of 12 mills presently in operation or under construction. Nine of these mills also employ the modified dregs washer.

Research, development, and field testing of this new type clarifier involved a period of four years from conception through formulation of present engineering specifications. For some time prior to 1950 it had been recognized that green liquor was short-circuiting in the compartments of the conventional balanced tray thickener, at that time the standard green liquor clarifier in the Dorr Recausticizing System. Feed introduced through a rather shallow feedwell seemed to stream toward the overflow weir instead of distributing uniformly through the entire tank cross-section.

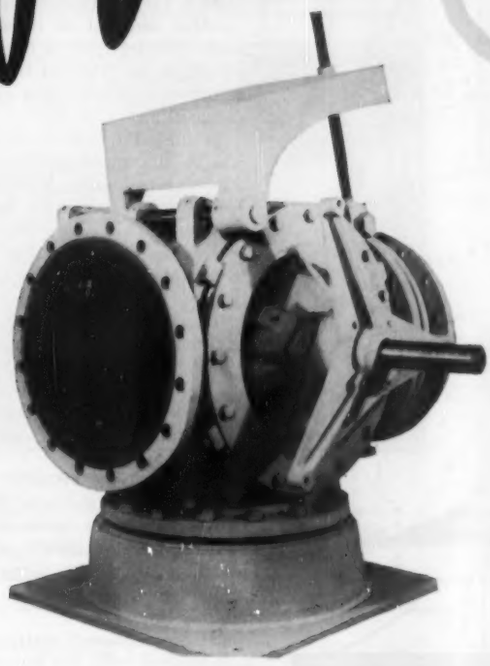
CONDUCT FIELD TESTS—A series of field tests was conducted at various operating mills in an effort to determine, if possible, the actual path of feed liquor in the clarifier. Results showed conclusively that feed was streaming from the feedwell to the overflow. With such a flow pattern only a small portion of the tank volume was being utilized to clarify green liquor, while the greatest part of the tank did not contribute in any manner to the removal of solids from suspension. Concurrently, an extensive research program was initiated at Dorr's Westport, Conn. Research and Testing Laboratories to investigate conditions necessary to promote optimum utilization of tank volume.

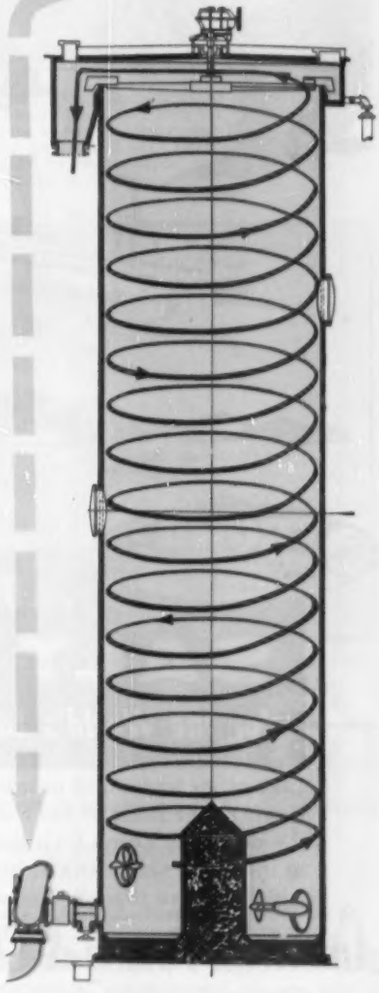
It was found that short-circuiting was minimized in tanks or compartments having a ratio of height to diameter rather greater than conventional, and having a feedwell of

This is the first report on new green liquor clarifier and dregs washer design, used in 12 kraft mills, mostly in Southeast U.S., written by The Dorr Co.'s Director of Sales Development, with assistance from Southern mill men.

Good Bleaching

STARTS HERE





IMPCO CHLORINE SAVER-MIXER

A new high intensity type chlorine mixer which gives a quick intimate mixing result, improving retention in the main tower and insuring uniformly chlorinated pulp.

This unit showed chlorine savings of 50¢ per ton or at a 300 ton daily production rate, over $40,000 per year, paying for the mixer in just a few months.

IMPROVED
MACHINERY INC.
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Sherbrooke Machineries Ltd., Sherbrooke, Quebec manufacture similar equipment in Canada.

C3-o

proper diameter conducting the new feed to an appropriate point deep in the space. The unclarified new feed, which obviously must have a higher density than the highly clarified suspension at the top of the tank, is thus conducted to a level where the density difference is minimized, rather than plunging to this level in an uncontrolled fashion.

Data were also obtained which revealed for green liquor an optimal relationship between tank detention and overflow rate. These research data clearly indicated the feasibility and advantages of redesigning the green liquor clarifier to take full advantage of these principles, which we call "selective density feeding." The new design comprises a single deep clarification compartment equipped with a raking mechanism to provide positive removal of dregs from the tank. The feedwell is larger in diameter than in previous tray units and terminates down near the raking mechanism.

TABLE I

GREEN LIQUOR CLARIFIER OPERATING RESULTS

Company	Clarifier Dia. ft.	Clarifier Depth, ft.	Flow, gpm	Overflow Rate, ft./hr.	Theoretical Detention Time, hrs.	Feed, ppm	Overflow, ppm (average)
Unit Clarifiers							
Macon Kraft Co., Macon, Ga.	40	24	490	3.42	7.25	890	135
			460	3.22	7.57	890	115
			400	2.80	8.72	890	72
National Container Corp., Valdosta, Ga.	40	15	300	1.92	6.54	860	65
Mill "A"	40	24	340	2.38	10.35	640	76
Four Compartment Balanced Tray Thickeners							
St. Regis Paper Co., Jacksonville, Fla.	24	23	180	0.83	7.22	1000	93
Mill "B"	35	23	340	0.73	8.12	950	117

It turned out that the new units would be approximately the same diameter as tray machines which would have ordinarily been recommended. This similarity facilitates conversion of existing tray thickeners in operating mills to the unit type, if desired.

The advantages of this new clarifier over the tray type are clearly evident:

(1) Initial investment is substantially reduced by elimination of all trays and all but a single raking mechanism.

(2) Operating attention is minimized by the absence of overflow sleeves and seals between compartments. The adjustments necessary to maintain these in proper balance previously consumed much of the operator's time.

(3) Maintenance costs are almost non-existent with but one mechanism and no trays to keep in operating condition.

Recognizing the need for practical demonstration of the principle of "selective density feeding," discussions were held with operating personnel at several mills while research and redesign were still in progress. The general theory and its possible advantage were explained, and acceptance was immediate and enthusiastic. Several mills were interested enough to convert existing tray units to the unit compartment design without further corroborating data, and those considering new systems readily accepted it as standard.

12 MILLS USE NEW CLARIFIER— By early 1954 a total of 12 paper mills, chiefly in the southeastern

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INDUSTRIAL AND AGRICULTURAL CHEMICALS

...Basic Source of
SALT CAKE
for the World's Largest Kraft Producers

Like other important industries, the great Kraft paper mills of the Pacific Northwest look to the desert at Trona for essential chemicals— in this case, SALT CAKE of highest purity, for which we are their principal source of supply.

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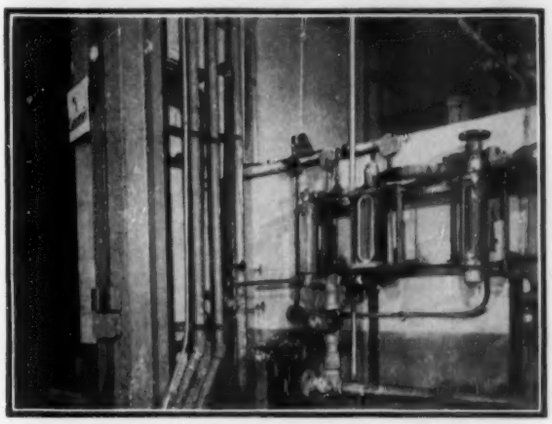
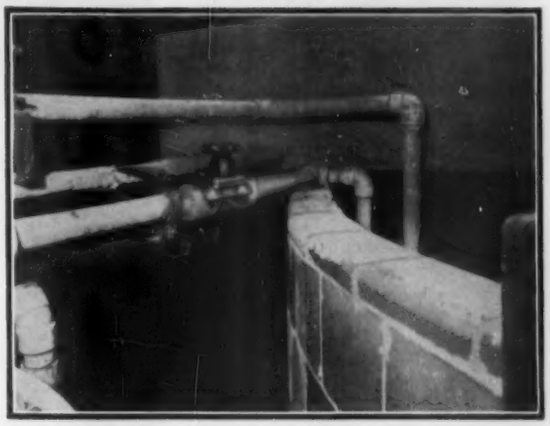
Paper mill licks corrosion problems with U. S. Uscolite plastic

Section of U. S. Uscolite plastic piping forming a manifold carrying highly corrosive alum from storage tanks. Here the alum line is broken up to carry it to several paper machines. Uscolite shows no sign of corrosion, after 2 years' service.



Uscolite piping and flanges on the lower bleach line. Two interchangeable pumps draw the bleach liquor from the bottom of the storage tank to the paper machines. The bleach liquor corrodes the insides of metal pipe—and the fumes, the outside. Uscolite pipe shows no signs of corrosion after 2 years of wear.



Uscolite piping taking bleach liquor from the storage tanks —via the upper bleach liquor line. Here the Uscolite pipe replaced metal pipe and rubber-lined pipe. Bleach liquor must be fed at an even rate. Unlike metal pipe, Uscolite piping does not build up internal deposits, and thus permits steady flow and control at all times.

Uscolite pipe and fittings are made in broadest and largest line of stock sizes on the market. Sizes run from ½" to 6".

Uscolite® plastic piping, fittings, flanges, deflectors, valves and fume ducts will handle any chemical used in paper mills, including alum, bleaches, brines, and chlorine. A product of United States Rubber Company, Uscolite is extremely light in weight, yet has very high impact strength. It is threaded and assembled with ordinary piping tools—*without* special preparation. Immediate delivery of standard sizes of pipe and fittings. The Uscolite Hills-McCanna valve is also available. Get in touch with any of our selected distributors or any of the 27 "U. S." District Sales Offices or write to address below.

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United States, were using or planning to use this newly designed clarifier either in new mills or in the conversion of existing systems. All 12 employed it in the green liquor clarifier and 9 of them in the dregs washer. In April and May of this year a survey of 5 mills was conducted to determine the performance of these units and to make engineering recommendations for further improvements. These mills were selected to provide a broad interpretation of operating results.

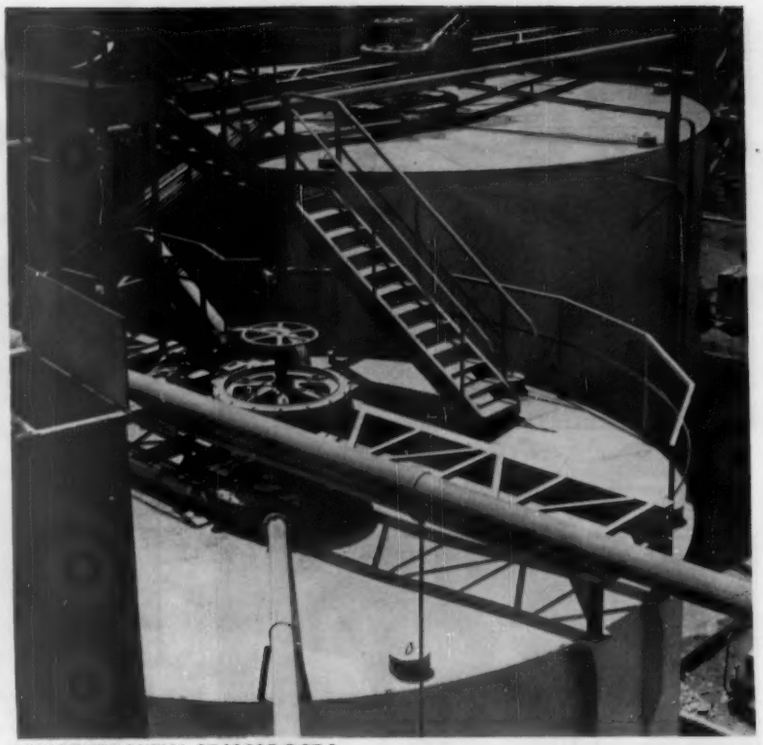
This survey produced results which had a profound influence on the present design of the green liquor section of the Dorr continuous recausticizing system. The five mills visited and green liquor clarifier operating results from each are listed in *Table I.*

The largest volume of green liquor being treated was at the Macon, Ga., mill of Macon Kraft Co. During the test period influent volume to a 40 ft. dia. by 24 ft. deep unit type clarifier varied from 400 to 490 gpm containing 890 ppm suspended dregs. Overflow clarity improved as the detention time was increased by reducing total volume of green liquor to the machine.

At the new National Container Corp. mill at Valdosta, Ga., another 40 ft. dia. clarifier, only 15 ft. deep, was producing a clarity of 65 ppm from feed containing 860 ppm dregs in 6.54 hours of theoretical detention. In fields other than pulp and paper it has been possible to check theoretical detention vs. actual detention using dye tests. However, the green liquor destroyed the effect of the dye in these tests, and no actual detention and resulting efficiency of the units could be obtained. Actual detention is, of course, less than theoretical but the factor to be applied in these cases must remain undetermined.

The third clarifier, same size as the Macon unit, was handling 340 gpm of liquor containing only 640 ppm dregs. Detention time at Mill "A" was approximately ten hours, but the overflow was no better than that produced in six or eight hours in the other clarifiers. This series of results indicated that once a concentration of 60 to 100 ppm in the overflow was attained, the floc settles more slowly and unusually long detention times were needed to further clarify the liquor. These results did not produce any strict correlation between detention time and overflow clarity.

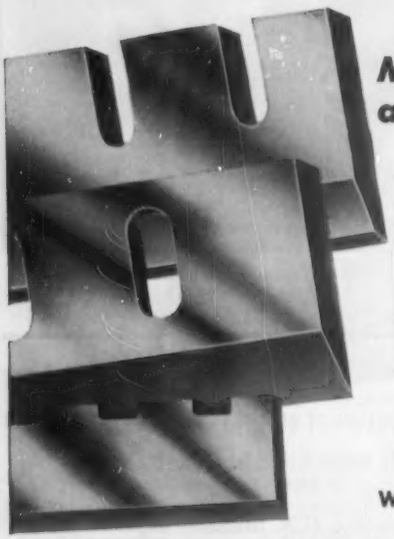
At the Jacksonville, Fla., mill of St. Regis Paper Co., the detention time was 7.22 hours, just about the same as the theoretical detention in one of the Macon Kraft tests. Feed was more turbid than that at Macon,



ANOTHER VIEW AT VALDOSTA

Green liquor section at National Container mill at Valdosta includes a 26 ft. dia. by 12 ft. deep dregs washer in foreground, and directly behind it a 40 ft. dia. by 15 ft. deep green liquor clarifier, both of the new design.

HI-PRODUCTION Chipper Knives



TRADE MARK SINCE 1891

More chips at lower cost

Wapakoneta HI-PRODUCTION Chipper Knives cut cleanly with fewer oversize chips and little dust waste. They take heavy feeds and cuts without chipping or cracking and retain sharp edges during long runs. Wapakoneta Chipper Knives are designed for punishing service with a minimum of reconditioning. Cut costs by cutting "down time" with Wapakoneta Chipper Knives.

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WAPAKONETA, OHIO

Knives Engineered for the Job Since 1891

Appleton Twins For Dual Economy

A new Appleton supercalender to increase production.
A modern Appleton rewinder for more speed. Team them up for *twice* the efficiency to cope with today's higher costs.

Appleton supercalender illustrated: 150" 12 roll, has shaftless unwind arrangement and automatic roll handling from elevated storage platform. Operates at 1800 f.p.m.

Appleton rewinder illustrated: 150" 2 drum, also ruggedly built, with low center of gravity to assure vibration-free operation. Operates at 3500 f.p.m.

APPLETON MACHINE COMPANY
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but using a four compartment balanced tray thickener better overflow clarities with 93 ppm suspended solids were obtained.

The second balanced tray thickener, located at Mill "B," handled a flow equal to the unit machine at Mill "A," but more heavily loaded with dregs. With a detention time slightly longer than that in one of three Macon tests, it produced about the same clarity green liquor. In short, results from this unit compared very favorably with results from the second test at Macon.

The three unit type machines produced overflow clarities equal to those of the two tray type units at overflow rates approximately three to four times as great. Thus, the new standard clarifier operating on the "selective density feeding" principle produced a comparable product at a lower initial installed cost, lower operating cost, and with reduced maintenance costs.

RESULTS OF FLOC TESTS—Second order flocculation tests, a laboratory procedure from which the rate of flocculation of particles is determined, were run in the field at each of the mills. These coupled with results of previous tests in other fields to determine detention efficiency, showed that a 10 ft. sidewall depth (12 to 16 ft. center depth depending upon clarifier diameter) was needed to produce an overflow with a clarity of 60 to 100 ppm suspended dregs. Most of the units marketed to date have been greater than 20 ft. in depth. These test results indicated that a maximum depth of 16 ft. will produce optimum clarification and that it is extremely difficult to produce a cleaner overflow without prohibitive detention. Thus, the added depth in present units does not add sufficient clarity to the overflow to justify the added expense of tank construction in most cases.

TABLE II
DREGS WASHER OPERATING RESULTS

Company	Washer Dia., ft.	Washer Depth, ft.	Washing efficiency % Na_2O removed
Unit Washers			
National Container Corp., Valdosta, Ga.	26	12	47.5
Mill "A"	26	24	60.2
Four Compartment Tray Washer			
St. Regis Paper Co., Jacksonville, Fla.	18	22	95.6

All three dregs washers from which results were collected (*Table II*) would have shown greater washing efficiencies if dregs had been pumped more often from the green liquor clarifier. The two unit type washers were receiving dregs once an hour. In the third instance green liquor clarifier underflow was pumped but once per 8-hr. shift to a washing tray thickener.

Greatest washing efficiency was obtained in the four compartment tray unit at St. Regis (see *Table II*) where 95.6% of the Na_2O fed to the washer was recovered in the overflow. The other two washers, located at National Container and Mill "A," recovered only 47.5% and 60.2% of the Na_2O respectively. Although the pumping schedule favored the single compartment units, a centrifugal pump did an excellent job of mixing dregs and overflow liquor from the second compartment before feeding the mixture to the top compartment of the tray unit.

Thickening and second order flocculation tests proved that unit area required to thicken the dregs governed the size of the dregs washer rather than the overflow rate or detention time to clarify the overflow liquors. Thus the size of the washer will be the same regardless of whether it is a unit or tray type machine. Once again economy points to the unit washer, if some means can be provided to pump dregs more often and to thoroughly mix dregs and wash water before sedimentation.

SPECIFICATIONS REVISED—As a direct result of this most recent survey The Dorr Co. has completely revised the specifications for the green liquor clarifier and dregs washer used in the Dorr recausticizing system. The standard green liquor clarifier will be of the unit compartment type with a large diameter deep feedwell extending well down toward the raking mechanism. It will have a sidewall depth of 16 ft. (12 to 16 ft. center depth) unless additional height is necessary to obtain head for gravity flow. In specific instances, such as in completely housed Canadian mills where space is at a premium, it may be necessary to employ a special two compartment unit 20 to 24 ft. deep. In such instances space gained is traded for more complicated operation and higher cost.

The dregs washer will also be of the unit compartment design, but will not be as deep as the green liquor clarifier. It will be a standard Dorr thickener with center and sidewall depth determined by the diameter. For the present a standard feedwell will be employed. However, an investigation of feedwell design is now in progress and may reveal the advisability of altering present design.

In addition, two other improvements have been made in the Dorr recausticizing system to overcome operating deficiencies revealed by the survey. A 15 minute cycle time clock

Like a smooth, regulated flow of water, Syntron Feeders move bulk materials from bins, hoppers and chutes to conveyor belts, ball mills, mixers and other processing installations. Easily installed for automatic or semi-automatic set-ups. Handle most materials from fine powders to coarse, heavy lumps, at controllable feeding rates from a few pounds to hundreds of tons per hour.

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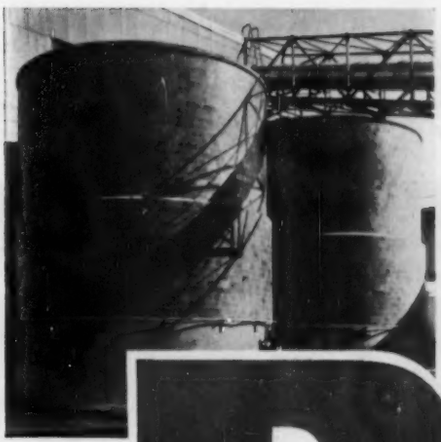

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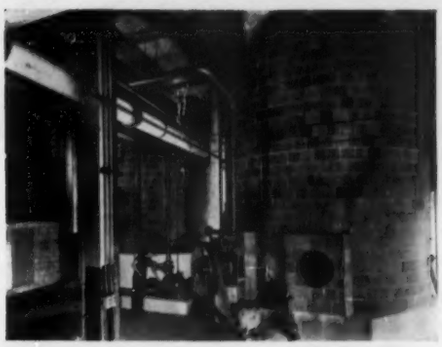

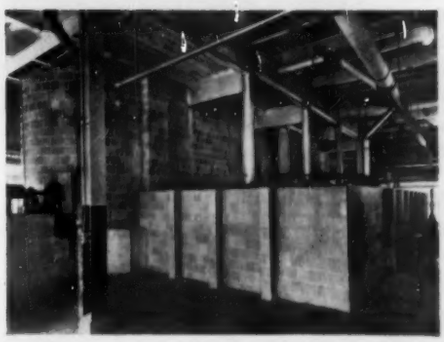

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For wet materials, these structures are reinforced concrete faced on both sides with glazed tile; for dry materials, they can be either this same construction or steel-reinforced hollow tile.

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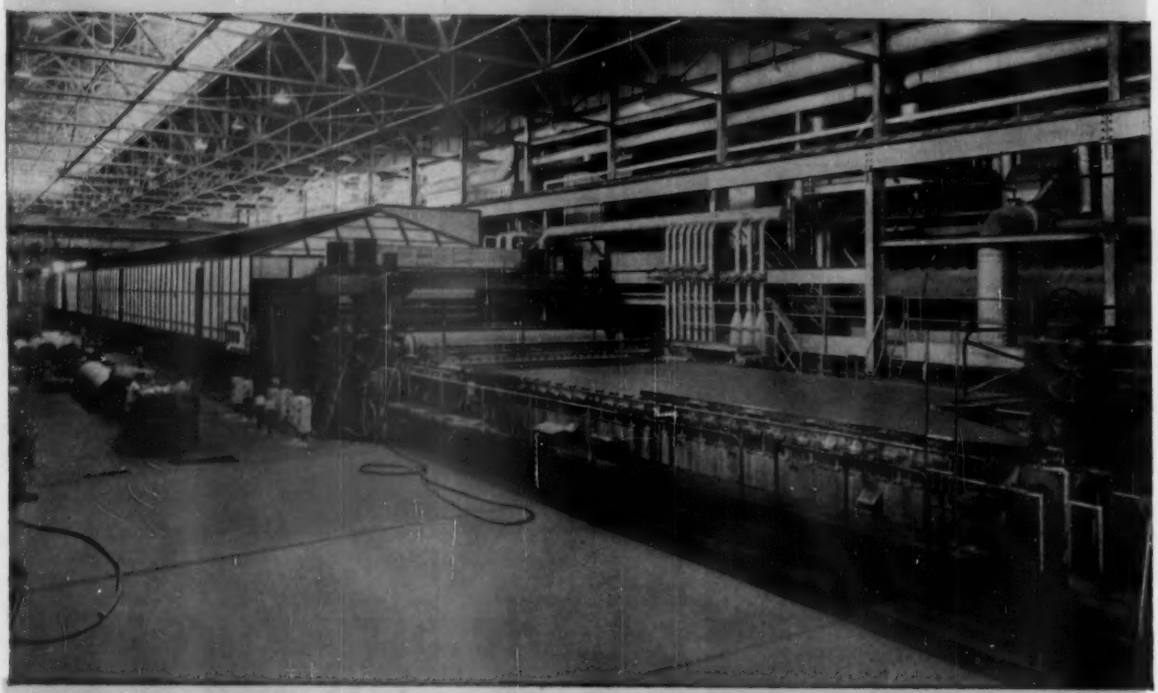
Union Bag with Puseyjones Machines



New No. 6 Puseyjones Fourdrinier Machine at Union Bag and Paper Co., Savannah, Ga. Fourdrinier is of Rapi-Drape construction for 120-foot wire; Press Part of Simplex design with two suction presses; Dry Part comprises 71-60" paper dryers and 16 felt dryers, with intermediate smoothing-marking press and size press; eight roll calender stack; Puseyjones horizontal track reel for 96" rolls. A General Electric multiple generator electronic-controlled sectional drive provides power for the various machine sections.

Sets World Production Record

There's a new world's record for production of Kraft paper and liner—a daily average of 1,801 tons for 30 days, and a high of 2,163 tons for a single day! That's the record set at the Savannah, Ga., plant of Union Bag and Paper Corporation, after its large expansion program "A" had increased to six the number of Puseyjones Fourdrinier machines.

All six Puseyjones machines are of 236" wire width. Unit No. 6 is designed for a speed of 2,000 feet per minute, and has all modern improvements including a winder built for speeds up to 6,000 feet per minute.

If you plan to rebuild for higher speed, increased production, reduced maintenance costs, or a greater range of high grade products, get the benefit of Puseyjones' experience. Our district representatives are factory-trained engineers, ready and well-equipped to help you on any machine problem. Call the representative nearest to you, or write us today.

THE PUSEY AND JONES CORPORATION
Established 1848. Builders of Paper-Making Machinery
Fabricators and Welders of all classes of Steel and Alloy Products
Wilmington 99, Delaware, U.S.A.

THE SIGN OF TRADE MARK SUPERIOR QUALITY

will be provided on the Type VM pump which transfers green liquor clarifier underflow to the dregs washer. It will pump for a pre-determined length of time, perhaps only 30 or 60 sec., once every 15 min., to remove thickened dregs at a constant density. Also a small mixing tank with agitator will be installed ahead of the dregs washer to insure more thorough mixing of dregs and wash water. The tank will have a detention time of 30 min., which, when combined with the more frequent pumping schedule, will even out the Na_2O flow to the dregs washer and make possible more complete soda removal.

In the final analysis, the results of the recent survey indicated that replacement of tray units with a unit compartment clarifier operating on the principle of "selective density feeding" was basically sound in both green liquor clarification and dregs washing, but that unusually deep design was not a necessity. Although further modifications will be made, present units are producing results entirely comparable to those from the tray units at a reduced initial cost and with a minimum operating attention and maintenance costs. Nevertheless, this new design cannot be considered final as evidenced by continuing development work on the dregs washer feedwell. In this respect, the equipment manufacturer must be ever mindful of his responsibility to continuously improve his product and market a system capable of maximum performance at minimum cost to the user.

REPRESENTING ALBANY FELTS AND CARTHAGE MACHINE CO.

MARCUS T. REYNOLDS, (left), recently named Representative for Albany Felt Co. in Minnesota, Western Wisconsin and Illinois, has new offices at 40 East Oak St., Chicago. His phone is Whitehall 4-6040. Mr. Reynolds graduated from Williams College in 1950 and has been with Albany since then, starting in the Albany, N. Y. plant.

ED CROWLEY (right), new Sales Engineer for Carthage Machine Co., Carthage, N. Y., will cover a greater part of the U.S.A., working under Nat Wardwell. Mr. Crowley was formerly with Infilco and prior to that was Bleach Plant Supt., The Northwest Paper Co., Cloquet, Minn.

Does the job faster... at lower cost!

Here's how...Check into the exclusive features of the Wellman-Browning Locomotive Crane and you'll see how it gives you:

Greater switching power. Drawbar pull is unsurpassed due to exclusive Torqflo hydraulic drive.

Smoother performance of hoist, swing, boom hoist and travel motions because of Torqflo and Metered Air Controls. Finger-tip control varies speed and power . . . eliminates jerks and shocks. Result:

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TIDLAND SHAFTS come in two types: (A) the leaf-type collapsible shaft for rewind, and (B) the lug-type for mill rolls. They are custom-built to meet your particular needs, using highest quality materials.

Because of their rigid construction and the tight hold they exert along the entire roll, Tidland Shafts eliminate deflections and resulting damage to cores and paper, and make higher maintained operating speeds possible.

It is not uncommon for a Tidland Shaft to pay for itself in a few weeks from this saving in time and paper. Simply designed, these shafts cost next to nothing to maintain.

Write for list of mills in your locality using Tidland Shafts.

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Manufactured by Tidland Machine Co.

CAMAS, WASHINGTON

Represented in New England by ORTON CORP., Fitchburg, Mass.

PAPERMAKERS VISIT SPECTACULAR SUMMER HOME OF CAPT. BILLY "WHIZZ BANG" FAWCETT

Trophies from all over world were seen in this luxurious summer home of late Capt. Fawcett, who made his "Whizz Bang" a magazine sensation a generation ago. So many bedrooms are in the elaborately rustic home at Breezy Point, Minn., visitors lost count. Seated, l to r: MRS. OTTO F. HASSEL, Wis. Rapids; JERRY STRASSER, Morningstar Nicol; MR. HASSEL, Board Supt., Consolidated Water Power & Paper; MRS. ED LAW, Jr., Mpls. In first standing row, l to r, starting with man behind lamp: L. J. HUBBELL, Asst. Supt., Beater Room, Northwest Paper; (in sport jacket) DICK NUGENT, Charge of Planning, Nekoosa-Edwards Paper Co.; HARRY HADLEY, Mill Mgr., Gardner Board, Middletown, and Pres. of Supts. Assn.; MRS. ROY KELLY; MURRAY STEMPEL, the host, and Exec. V. P. of Paisley Products; PHIL BUDD, Asst. to Mfg. Mgr., Northwest Paper. In second row, standing: R. E. NOREUS, Mgr. Tech Dept., Northwest; ED G. GREMBAN, Asst. Paper Supt., Nekoosa mill, Nepco; LEO GAYOU, Mgr. of Northwest Paper's Brainard mill; MRS. GAYOU; MRS. HERB GARDNER, Wauwatosa, Wis. Others in back row (l to r): EDWARD J. LAW, Jr., Supt., Waldorf Paper Products; HERB GARDNER, Morningstar Nicol rep. in 6 Midwest states; JOE SMART, Asst. Paper Supt., Nekoosa mill, Nepco, and directly behind him—H. H. HUSEBY, Bleach Supt., Northwest; MRS. NOREUS; MRS. JOE JENKINS; MR. JENKINS, Finishing & Shipping Supt., Northwest, and ROY KELLY, retired Mgr. of Papermaking, Marathon.

Englishman Conducts Pacific Coast Tappi Seminars

Dr. Herbert F. Rance, of the Wiggins Teape Group Research Organization, Bucks, England, conducted the 8th Annual Seminars held for two days each in Seattle, Wash., and Portland, Ore., in late September under the sponsorship of Pacific Coast Tappi, with technicians from West Coast mills welcomed at a nominal fee to defray seminar expenses.

Dr. Rance, who is Manager of Research and Development of the Wiggins Teape Group and also has charge of all Technical Departments in the Group's 14 mills (which make one quarter of the specialty paper of Great Britain), discussed the general relations between paper structure and behavior. Starting with a concise description of the types of structure obtainable and their components, he proceeded to describe how the structure is affected by the papermaking variables; stressing the action of water removal in determining the final paper structure which was then related to the papers physical properties. Finally a review of recent rheological studies was presented and a theory explaining paper behavior in terms of a qualitative study of structure suggested.

The Seattle seminars were well attended by mill technicians, while the registration at Portland was 51.

Champion to Share Profits

A profit-sharing plan for employes has just been announced by Champion Paper & Fibre Co., whereby 15% of Champion's profits before taxes will be allocated to them.

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PENNSALT OFFERS 3 BASIC CHEMICALS FOR BETTER PULP

1. CHLORINE 2. CAUSTIC SODA

NEW 3. SODIUM CHLORATE

PENNSALT, long a supplier of Chlorine and Caustic Soda to the pulp and paper industry, also offers Sodium Chlorate—a chemical improvement for better pulp refining.

Using Sodium Chlorate in a generator in your own plant, you can produce Chlorine Dioxide. This chemical bleaches wood pulps whiter and brighter than common bleaching agents.

Chlorine Dioxide does not harm the pulp's physical or chemical properties, yet it has the power to destroy wood and bark specks and thereby give a cleaner end product. Because of this bleach's powerful, selective action, woods ordinarily considered unfit may be used to make quality pulp.

To help you put the process to work in your plant, Pennsalt offers both service and supplies. Experienced engineers will help you design a generator and initiate the process. Pennsalt's Portland, Oregon plant can supply you with commercial grade Sodium Chlorate, 99% guarantee, fine crystal size, in drums or tank cars.

Write for more information on this outstanding new bleaching process, or on Pennsalt's Big Three—Chlorine, Caustic Soda, Sodium Chlorate.

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GEIGY CHEMICAL CORP. has named new alignments of personnel, according to Samuel S. Harkavy, director, Paper Dept., Geigy Dyestuffs. John J. DeJongh, Groton, Mass., will continue to call on New England accounts and parts of New York, and will be technical aid to G. A. Wilkie and R. W. Redston in Quebec; F. G. Thwaites, Toronto, will continue to serve mills in Ontario and Western Canada; Dudley J. Nixon, New York, will cover mills in Philadelphia and New York area and give technical aid to L. C. Voss in Ohio; Herman H. Gottsleben, Appleton, Wis., will call on Lake States accounts, assisted by William A. Ludke, who also looks after the Appleton warehouse; Daniel P. Fessia, from New York, will aid Charlotte, N.C. and Chicago; Walter Kenowski heads lab service in New York.

NEW WASTE WOOD CHIPPER

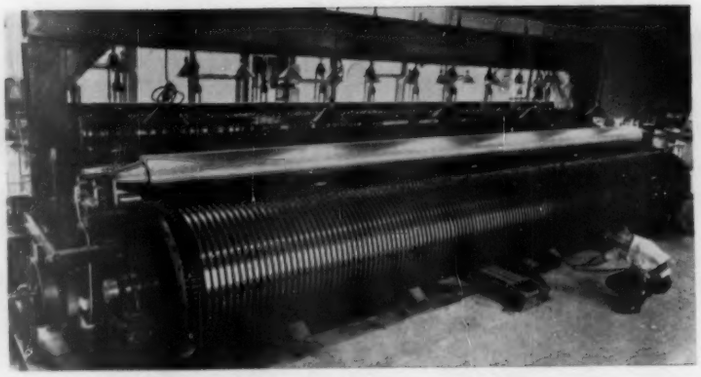
A waste wood chipper especially designed for sawmills who wish to make chips economically is offered in three disc sizes: 36", 42" and 48". Under normal operation these chippers can produce up to 15, 18 and 22 cords per hour respectively with low horsepower.

Tests made on southern pine slabs indicate that the chips produced by these machines may not need screening. The economy factor from this point alone is considerable. Most sawmills can pick enough clean wood off their waste conveyor to make a chipper installation well worth while, even without barking.

These chippers are ruggedly constructed and are designed especially for easy installation and low maintenance. These chippers are produced by the Hansel Engineering Company, 1500 Westlake Avenue North, Seattle 9, Washington. Inquiries in the South may be made to Owen-Richards Company, 1009 2nd Avenue North, Birmingham 4, Alabama.

Comparative tests made with the Hansel chipper and other chippers on Southern pine slabs indicate that the Hansel chipper makes a superior paper with greater strength. As a result of these tests several of these chippers are being ordered by a large kraft mill in the South.

(ADVERTISEMENT)



Giant Loom Weaves Wires

The giant 292 in. wire cloth loom shown here is the largest in the United States, according to Eastwood-Nealley Corp., and is now weaving in its plant at Belleville, N. J. Representing most advanced design, its controls have made Fourdrinier wire production as automatic as is possible.

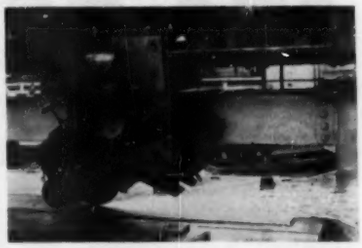
Some idea of its size is conveyed by this view of the huge back beam just after the warp was "beamed on."

STANLEY STEEL STRAPPING DIV. of The Stanley Works, New Britain, Conn., has announced restyling of the Stanley A Sealer Tool, used for sealing ¾, ½, ⅝ and ¾ in. steel strapping. Two major changes were made—heavy zinc plating has been placed over all metal parts of the sealer, and old-style handles have been replaced with bright green handles of touch ethyl cellulose. Both changes result in greater durability as well as better appearance.

PACIFIC INDUSTRIAL ENGR. Inc., 830 Security Bldg., Pasadena, Calif., announces new white-water clarification equipment called Pacific Separator. The clarifier operates on the flotation principle and is said to meet high efficiency demands for clarified water reuse, be simple to install and operate. Pacific Industrial directors and staff have wide experience in industrial waste treatment.

BLACK-CLAWSON CO. has entered into an agreement with **F. W. ROBERTS MFG. CO., Inc.,** Lockport, N.Y., for manufacture and sale of the patented continuous Roberts Grinder by its Shartle Bros. Machine Division, Middletown, O.

NATIONAL ANILINE DIV. of Allied Chemical & Dye Corp. has opened a new branch at 4814 Loma Vista Ave., Los Angeles 48, Calif., where William A. Ingham is in charge. Harris Fenn, San Francisco, is Pacific Coast manager.



New Stainless Steel Cutter

To supply, on immediate call, stainless steel flat bar ¾ to 2 in. thick in a multiplicity of widths, standardly stacked plates were used and the saw shown above was developed, after 8 months of research, by Alaskan Copper Works, Seattle, to cut the flat bar. The saw, with its hydraulic hold-down device, develops a perfectly straight edge while cutting, and does not induce magnetism in the plate as a shear cut would.

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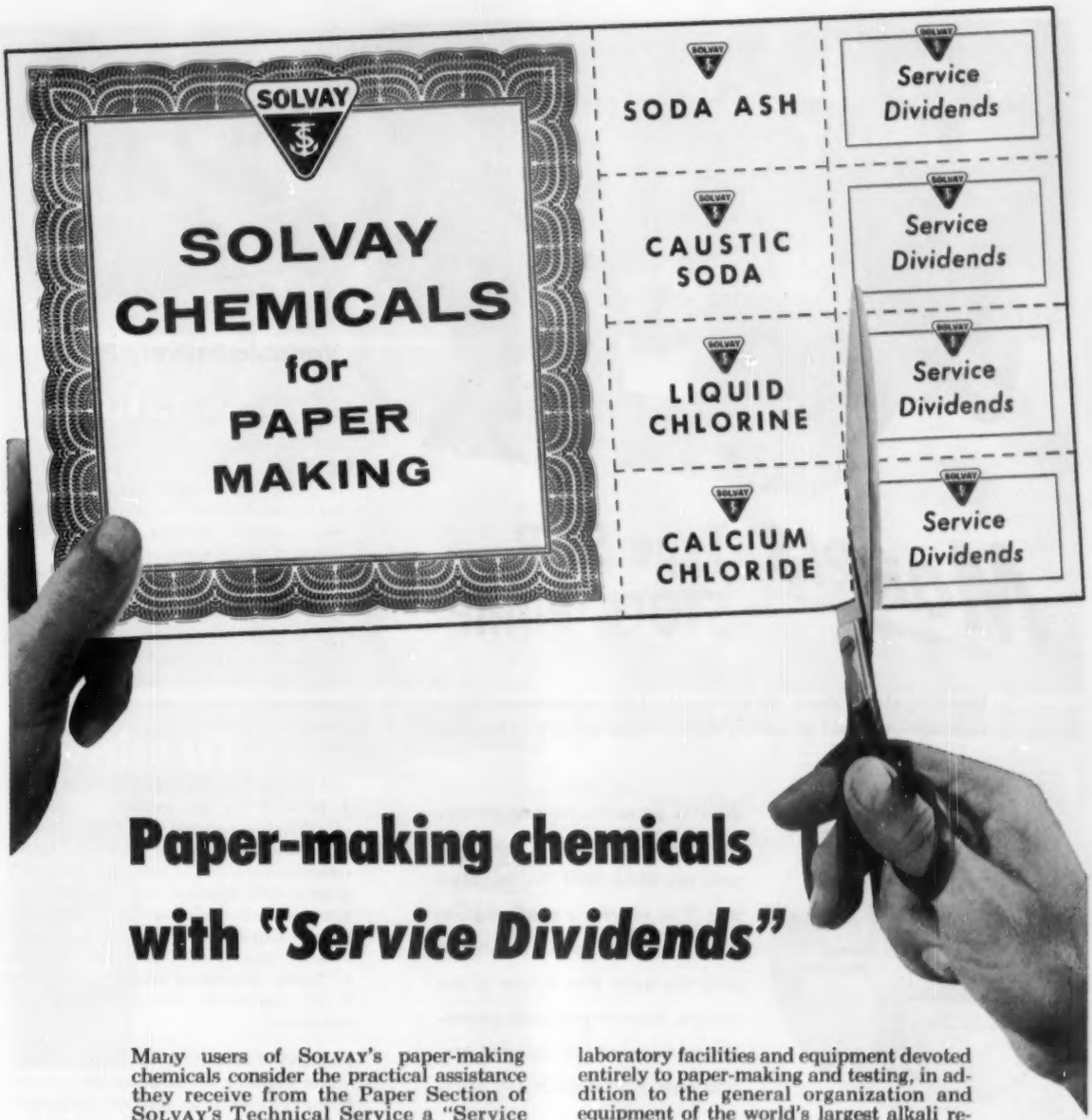

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- They have the added knowledge and experience that comes from many years of working solely with the Paper Industry.
- They have at their disposal extensive laboratory facilities and equipment devoted entirely to paper-making and testing, in addition to the general organization and equipment of the world's largest alkali research laboratories.

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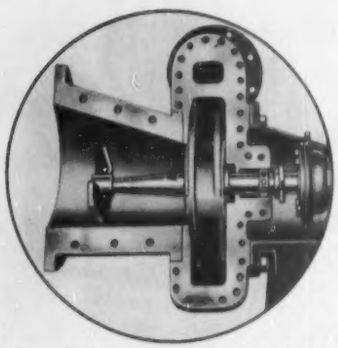
No Pulsation; No Dehydration of High Consistency Stock

MORRIS Type ST-P STOCK PUMP

Handles clean stock of extremely high consistency — up to 8% — without pulsating flow, dehydration or clogging.



View showing suction booster and impeller

Morris' patented suction booster mechanically agitates and propels the stock into the impeller eye. The eccentric configuration of the suction nozzle combined with the axial flow action of the suction booster prevents extraction of water and clogging of suction pipe with dehydrated fibre.

Another point. The resultant constant feed assures flow throughout the system, free from pulsations. Steady action helps keep down shaft deflection — holds packing wear to a minimum.

Write for Bulletin 176, giving sizes, capacities and engineering data.

MORRIS MACHINE WORKS
Baldwinsville, N. Y.
Sales Offices in Principal Cities

MORRIS *Centrifugal Pumps*

Variable Delivery Pump

Various uses in paper production are being made with variable speed straight line and rotary drive applications requiring 1 to 3 hp under precise speed or pressure control. Oilgear Co. is building a complete new line of one- and two-way variable delivery pumps. Each pump is a complete package unit incorporating variable delivery, high pressure, radial piston pump with patented, balanced flat valve, constant delivery, low pressure gear pump, and one of 8 standard controls. Photo shows Oilgear Type AE-311 2-way variable delivery pump with electric geared head motor control, oil reservoir base and 3 hp electric drive motor.

SPENCER CHEMICAL CO. announces J. R. Riley Jr., vice president in charge of sales, has resigned but will continue as consultant, director and executive committeeman. J. E. Culpepper, formerly general sales manager, was elected vice president and will continue as general sales manager. Harold R. Dinges is new assistant general sales manager; George V. Taylor, director of product sales; and E. W. Segebrecht, director of sales development.

ALBANY FELT CO. of Canada Ltd. makes available to Canadian felt manufacturers licenses to produce synthetic-content paper machine felts as covered by patent recently granted to Albany. Nominal charge of $1 per license will be made. Z. J. Chagnon, exec. vice pres. of Albany Felt of Canada, said: "Our company is happy to make this patent available to felt makers. Lack of such permission would cripple many felt manufacturers who have begun to produce nylon-contents felts and would retard progress being made in developing felts that can bring the paper industry greater and more efficient production."

E. G. "SID" DREW, managing owner of Drew Engineering Co., Portland, Ore., is vice president of Western Fabricators, Inc., recently established at Portland for manufacturing commercial and industrial sheet metal items. Drew Engineering continues under his separate management.

NEW Du Pont Paper White BN will make your paper whiter than words — or pictures — can say

You'll have to see it to believe it—a dye that makes paper so white that most of today's papers look dull and gray by comparison!

White as a field of cotton at picking time? No. There never was a cotton boll *this* white.

White as new-fallen snow? Frankly, that doesn't describe it either. The only way you can see just how white paper can be is to send in the coupon below for a sample of paper dyed with new Du Pont Paper White BN.

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BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

Fill in This Coupon and Mail Today for Samples

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Gentlemen:

Please send me samples of paper dyed white with new Du Pont Paper White BN.

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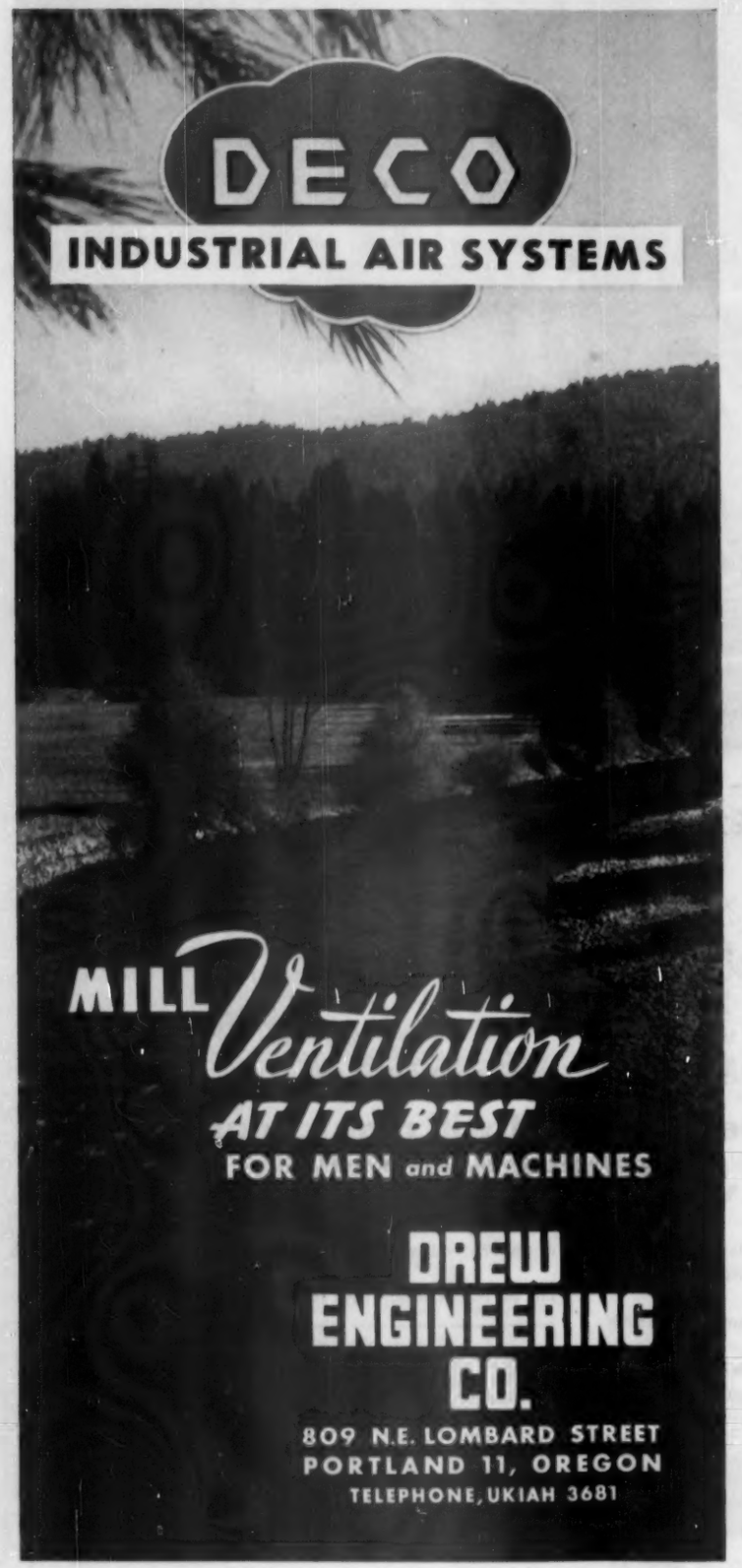

IF

YOU USE HIGH GRADE COATED OR UNCOATED BOXBOARD
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YOU WOULD LIKE A PERMANENT CONNECTION

A WELL ESTABLISHED MILL IN THE MIDDLE WEST, WHICH DOES NOT DO ANY CONVERTING, WOULD LIKE TO HEAR FROM YOU. REPLY BOX 196, PULP & PAPER, 370 Lexington Avenue, New York 17, New York

TECHNICAL SERVICE DIRECTOR

Excellent opportunity for Technical Service Director in a large progressive pulp and paper mill located in the Middle Atlantic States.

Prefer Ph.D. or M.S. in Chemistry or Chemical Engineering. Candidates must be at least 35 years of age, possess administrative potentialities and have industrial experience in the field of pulp, paper, coatings, quality control and other related problems.

Will be expected to assume full responsibility for the management of the Technical Services Division and conduct programs in Product Improvement and Development, Process and Equipment studies and train young technical graduates in phases of pulp preparation and paper making.

Remuneration will be commensurate with qualifications. Liberal company benefits. Replies held in strictest confidence.

Box 194, PULP & PAPER, 370 Lexington Ave., New York 17, N.Y.

SUPERINTENDENT for Multiwall Paper Bag Plant located in California. Full charge all manufacturing operations. Send full details of education, age, background and industrial experience in first reply. Communications will be kept strictly confidential. Reply to Box 190, PULP & PAPER, 370 Lexington Ave., New York 17, New York.

RESEARCH MAN

Large Mfr. wood fibre products has opening for research man capable of heading up small department west coast plant. Excellent opportunity for progress. Write fully as to background and present status. Box 200, PULP & PAPER, 370 Lexington, New York 17, N.Y.

WANTED

BEATER ENGINEER. Mill in Midwest making high grade rag content papers has vacancy for Beater Engineer who is also a good colorman. An excellent opportunity for the capable man. Apply in first instance to Box 189, PULP & PAPER, 370 Lexington Ave., New York 17, New York.

WANTED

AIR DRIER OPERATOR with experience on Clark Aiken Air Drier. Only men capable of taking full charge of machine and its operation should apply to Box 187, PULP & PAPER, 370 Lexington Ave., New York, New York.

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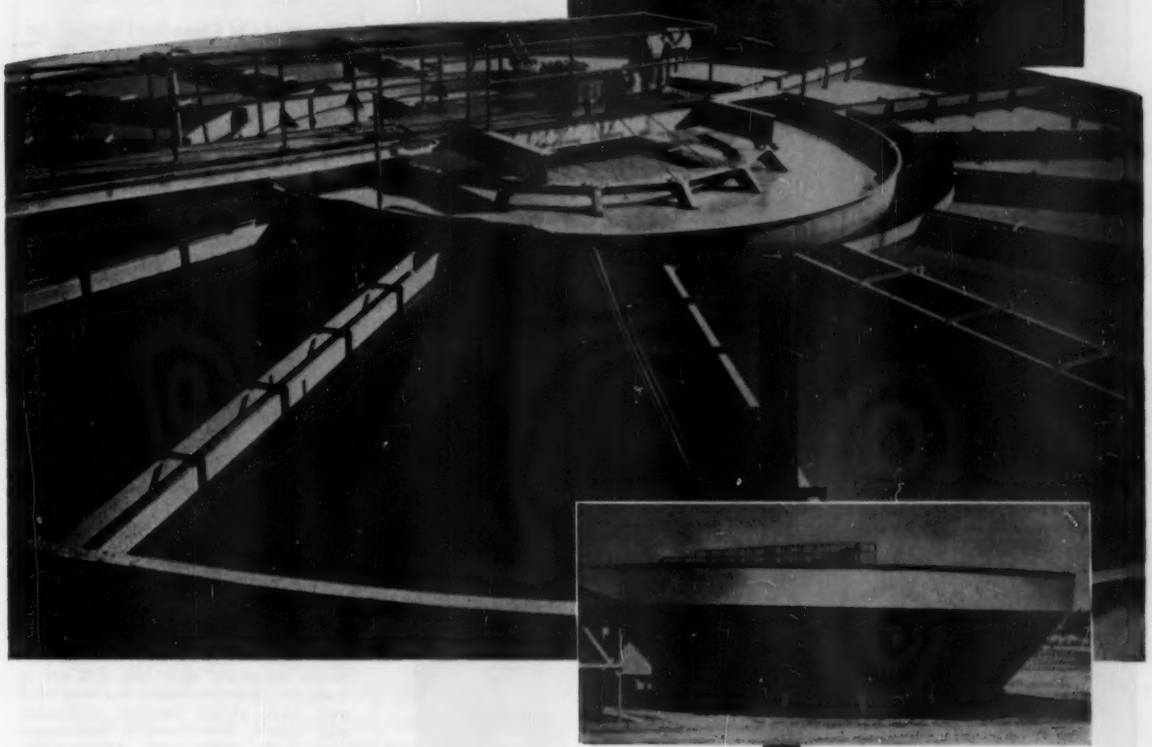
that highest quality can be obtained at lowest installed cost!



PROCESS WATER of highest quality (low color, iron and alkalinity) was the requirement of this paper mill . . . regardless of changes in raw water. In addition, space and installed cost were important considerations.

On all of these counts — uniform effluent quality, installed cost, and space savings — the Accelator secured the job, just as it has on many other installations. (Accelators are treating more than *one billion* gallons per day!)

Space and installation economies are illustrated in the photographs above. Note how the Accelator tank is shaped for simple support on concrete pad and buttresses. This meant savings in installation costs. Space savings are evident when you consider that this *single tank* combines mixing, coagulation and clarification and can treat 10 million gallons per day!

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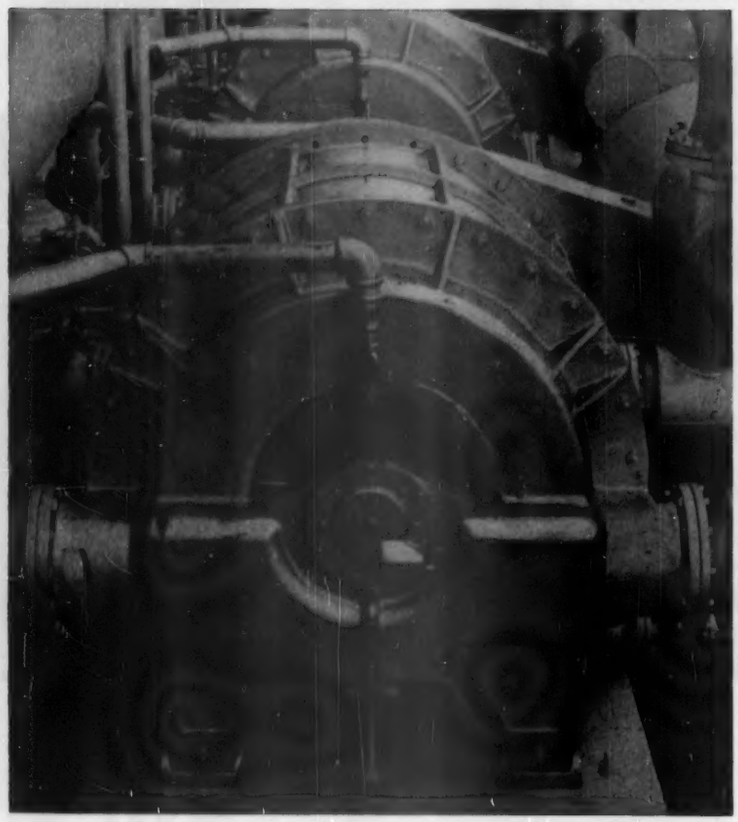

Air from the suction rolls on paper machines carries with it substantial quantities of moisture. This considerably reduces the effective air handling capacity of any vacuum pump except the Nash. In the Nash Vacuum Pump, because of the unique principle of operation, the bulk of this vapor is effectively condensed inside the pump. The total capacity of a Nash is therefore increased.

When you specify a Nash Pump it can be closely sized to the job. It is not necessary to select an over-sized unit, because the rated capacity of the Nash may be relied upon.

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294 Washington St., Boston 8, Mass.
Phone LIberty 2-6547

Chemist Or Chemical Engineer

Opportunity available for Chemist or Chemical Engineer in an expanding pulp and paper mill located in the Middle Atlantic States. Age 25-35 years with several years experience in pulp and paper chemicals and fibers. Good salary with excellent opportunity for advancement. Send resume of educational background and industrial experience. All replies confidential. Box 174-A, PULP & PAPER, 370 Lexington Ave., New York 17, N.Y.

HELP WANTED

SALES ENGINEER—to cover seven Midwestern States, selling paper mill equipment. Must be married, age 30 to 45, engineering education, degree not necessary. Reply to Box 195, PULP & PAPER, 370 Lexington Ave., New York 17, New York.

WANTED

SUPERINTENDENT. An excellent opportunity for a keen, energetic man to join the staff of fine paper mill currently making rag content papers for commercial, Government and technical purposes. Successful applicant will act as Assistant Superintendent for a period and when ability proven, promotion will follow. Remuneration commensurate with experience. Applications, which will be treated in strictest confidence, should be addressed to Box 186, PULP & PAPER, 370 Lexington Ave., New York, New York.

WANTED

SUPERVISOR for bag plant converting operations, preferably one with wide experience in grocery, specialty and sack bag production.

CHARLES P. RAYMOND SERVICE, INC.

294 Washington St., Boston 8, Mass.
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Wanted for 600 ton Kraft Pulp Mill in paperboard plant. Must be competent and experienced. Salary open. This position is with a large company and is a real opportunity for a capable person.

Box 193, PULP & PAPER
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Examine sheet after sheet of Hammermill's fine papers for business and advertising use. Look closely through the entire line of weights and colors—it's dollars to doughnuts you will not find a felt mark.

How come? Well, Hammermill uses felts with such perfect weave, such soft, deep nap, that there isn't a chance that there can be any felt marks. And, because there are no felt marks on Hammermill papers, there is no way to tell what makes of felts they use.

I've got a hunch that HAMMERMILL uses lots of

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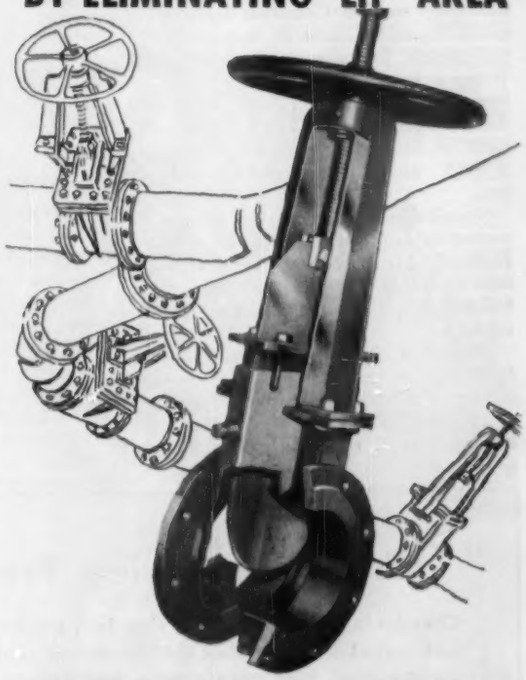

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C.I.P.-Brown Deal is Closed

Brown Corp. has sold its Quebec woodlands holdings and bleached sulfate pulp mill to Canadian International Paper Co., and its hydro-electric power interests to Shawinigan Water & Power Co., according to an announcement by presidents of the three companies, Laurence F. Whittemore of Brown, Vernon E. Johnson of C.I.P., and J. A. Fuller of Shawinigan.

Shareholders of Brown Co. are expected to approve on Nov. 19 at a Portland, Me., meeting. Total consideration is between $40,000,000 and $45,000,000, depending on final inventory.

Properties include approximately 2,500,000 acres of woodlands, consisting of Crown lands under lease and freehold properties. The pulp mill has an annual capacity of 165,000 tons.

WANTED

CHEMICAL SALESMAN specializing in technical sales to pulp producers. New product with outstanding potential. Application proven. Excellent future for right man to head this specialized department for growing petrochemical company. Send complete resume to Box No. 198, PULP & PAPER, 370 Lexington Ave., New York, 17, N. Y.

INDUSTRIAL ENGINEER

College graduate, experienced in planning and scheduling production process, cost reduction, statistical reporting and process improvement for an expanding pulp and paper mill located in the Middle Atlantic States. Age to 30. Good salary and opportunity for advancement. Send complete resume. All replies confidential. Box 176-A, PULP & PAPER, 370 Lexington Ave., New York 17, N.Y.

SANITARY ENGINEER

Opportunity available for Sanitary Engineer in an expanding pulp and paper mill located in the Middle Atlantic States. Age 25-35 years. Experience in paper mill wastes, stream pollution and water purification or similar experience. Good salary and advancement. Send resume of educational background and industrial experience. All replies confidential. Box 175-A, PULP & PAPER, 370 Lexington Ave., New York 17, N.Y.

SUPERVISOR available immediately for shipping, warehousing, yard and wood handling, or finishing room. Years of experience. Box 199, PULP & PAPER, 370 Lexington Ave., New York 17, N. Y.

WANTED: Pulp Mill Superintendent for new board mill located in the South. Experience in the production of hardwood pulps made by the neutral sulphite semi-chemical process and a background of bleaching experience essential.

Replies will be kept strictly confidential. Submit age, education, experience, present and past positions. Address Box 197, PULP & PAPER, 370 Lexington Ave., New York 17, New York.

WANTED

MACHINE TENDER. Experienced Machine Tender required for fine paper mill making rag content papers. Only men capable of taking full charge of machine and its operation should apply to Box 188, PULP & PAPER, 370 Lexington Ave., New York 17, New York.

WANTED

Structural Engineer familiar with steel and concrete design. Apply to C. A. Redden, Chief Engineer, Hollingsworth & Whitney Company, Waterville, Maine.

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Chemipulp's high degree of chemical, mechanical and physical control over materials and operations results in maximum plant output, high pulp quality, and low operating costs.

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New Tissue Machine

August issue of PULP & PAPER featured a story on E. B. Eddy Co. Ltd., Hull, Quebec, pointing to the fact that this year would see completion of a four-year program. One of these developments, a new Beloit tissue-making machine, was put into operation last month. Largest and speediest in Canada, it cost $4.5 million before the starter button was pushed.

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Indeed, from woodpulp to paper is merely part of the story. From pulp to cellophane, photographic film, sausage casings, lacquers, plastics, smokeless powder, and endless other products would still not give the whole picture. Researchers are every day developing significant new products from woodpulp to improve our living.

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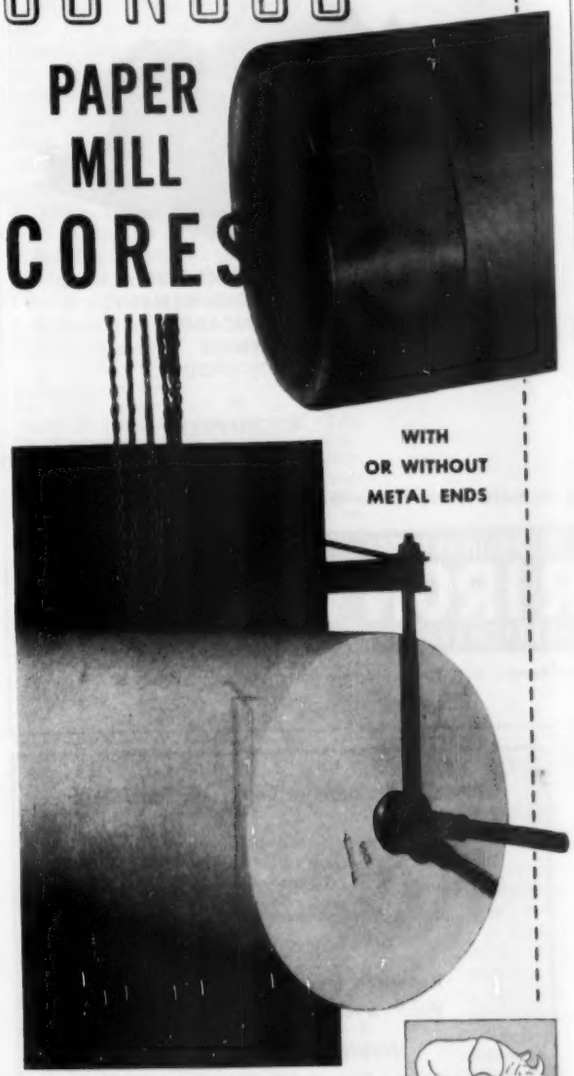

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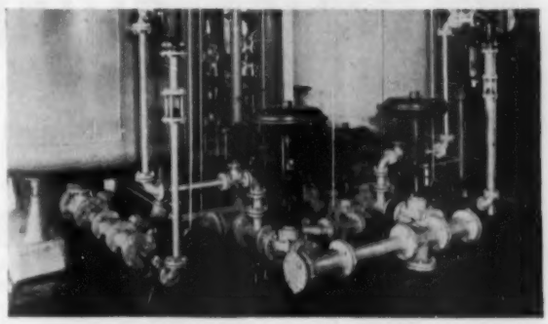
CORROSIVE LIQUIDS CAN'T HURT THIS INSTALLATION

Large midwest corn processor installs SARAN lined pipe, fittings and valves



When one of the largest processors of corn in the midwest was faced with the problem of handling corrosive liquid safely and efficiently in an ion exchange system, they investigated saran lined pipe and fittings.

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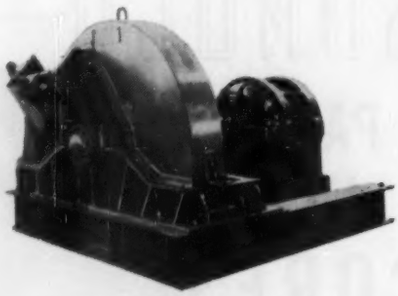

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TRENTON 8, NEW JERSEY

Publishers Mill Buys Adjacent Plant

Publishers' Paper Co., Oregon City, Ore., has purchased the 90-year-old Oregon City Manufacturing Co. property adjacent to Publishers' plant for reportedly over $1,000,000. This includes water rights, building and two acres of land which had formed an "island" in the paper company holdings. Possession is to be at the end of 1955. The plant purchased originally made woolen materials.

Publishers' officials participating in the transaction include Pres. Norman Chandler, Vice Pres.-Gen. Mgr. Sam J. Robinson and Vice Pres.-Mill Mgr. Carl E. Braun.

Statement required by the Act of August 24, 1912, as amended by the Acts of March 3, 1933, and July 2, 1946 (Title 39, United States Code, Section 233) showing the ownership, management, and circulation of Pulp & Paper, published monthly except in July when publication is semi-monthly at Bristol, Connecticut for October 1, 1954.

1. The names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, Miller Freeman, 370 Lexington Avenue, New York 17, New York; Editor, Albert W. Wilson, 1791 Howard Street, Chicago 26, Illinois; Managing Editor, None; General Manager: Wm. B. Freeman, 121 Second Street, San Francisco 5, California; Business Manager, Ralph R. David, 370 Lexington Avenue, New York 17, New York.

2. The owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding 1 percent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a partnership or other unincorporated firm, its name and address, as well as that of each individual member, must be given). Miller Freeman Publications, Incorporated, 121 Second Street, San Francisco 5, California; Miller Freeman, Jr., Wm. B. Freeman, 121 Second Street, San Francisco 5, California; L. K. Smith, W. E. Crosby, 71 Columbia Street, Seattle 4, Washington.

3. The known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: None.

4. Paragraphs 2 and 3 include, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting; also the statements in the two paragraphs show the affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner.

Miller Freeman, Jr.,
General Manager

Sworn to and subscribed before me this 27th day of September, 1954.

[Seal] Barbara M. Hampson
San Francisco, California

My Commission expires February 18, 1958.

A Cochrane Hot Lime Zeolite installation in a large Western Refinery. Hot Process unit at right is followed by eight 9-ft. filters and zeolite units designed to 150 lb. ASME code.

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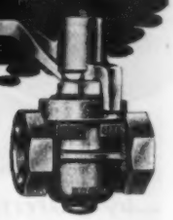

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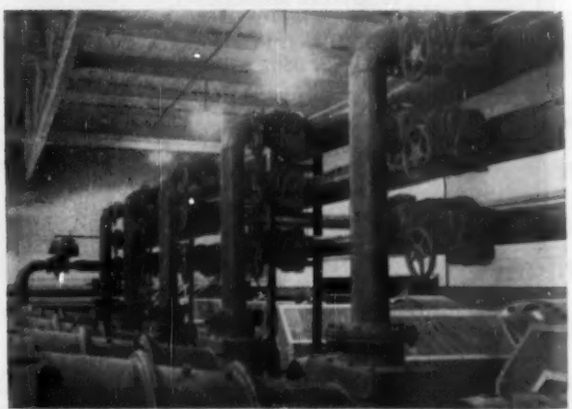

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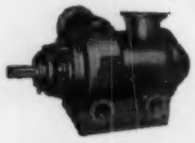

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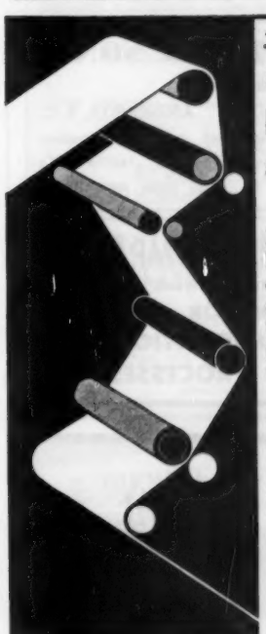

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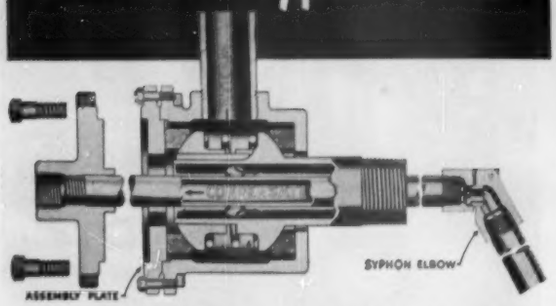

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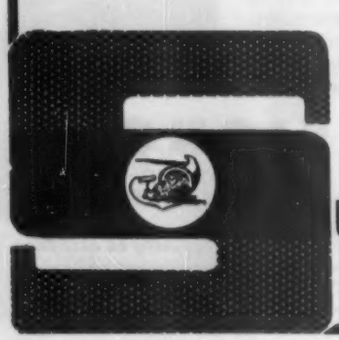

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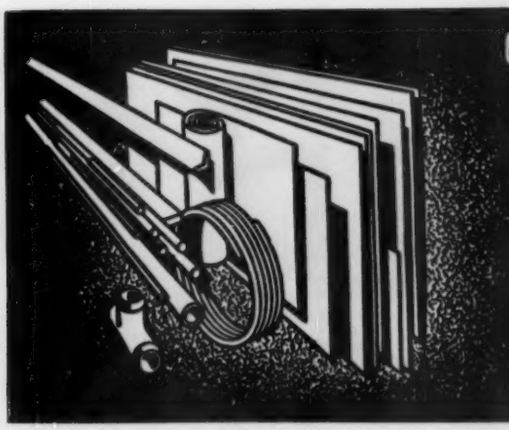

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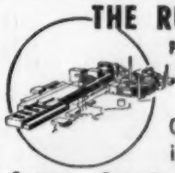

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